VSB — TECHNICAL UNIVERSITY OF OSTRAVA

FACULTY OF ECONOMICS

DEPARTMENT OF FINANCE

Zhodnocení finanční situace společnosti Petro China Co. Ltd.

Financial Situation Assessment of the Petro China Co. Ltd.

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Ostrava 2016

VŠB - Technical University of Ostrava
Faculty of Economics
Department of Finance

Bachelor Thesis Assignment

Student: **Mengyan Jin**

Study Programme: B6202 Economic Policy and Administration

Study Branch: 6202R010 Finance

Title: Financial Situation Assessment of the PetroChina Co. Ltd.
Zhodnocení finanční situace společnosti PetroChina Co. Ltd.

The thesis language: English

Description:

1. Introduction
2. Description of the Financial Analysis Methods
3. Comparison of the History and Present Financial Situation
4. Financial Analysis of the PetroChina Co.
5. Results Summary
6. Conclusion

Bibliography
List of Abbreviations
Declaration of Utilisation of Results from the Bachelor Thesis
List of Annexes
Annexes

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Extent and terms of a thesis are specified in directions for its elaboration that are opened to the public on the web sites of the faculty.

Supervisor: **doc. Ing. Miroslav Čulík, Ph.D.**

Date of issue: 20.11.2015
Date of submission: 06.05.2016

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The declaration

"Herewith I declare that I elaborated the entire thesis, including all annexes, independently."

Ostrava dated 29.04.2016

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Mengyan Jin

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Annexes

1.! Introduction

In this era of rapid economic development, evaluating of company is indispensable, important and widely used in finance. We need to evaluate such as company's operations, expenses to manage the company and attract investors.

This thesis aims to evaluate the financial condition of the company which is called Petro China Co. This company is one of the largest companies in China and also the largest distributor and producer in gas and oil industry of China. We will analyze the company's financial data from 2010 to 2014.

This thesis has six chapters.

The first chapter will introduce the main goal and the structure of this thesis.

The second chapter describes the methods of financial analysis that will be used in the chapter 4. Moreover, many important financial ratios and models will be explained more clearly.

The third chapter introduce the basic information of Petro China Co which includes the general financial situation of the company for different years and company's main businesses.

The forth chapter is the most important chapter in this thesis. In order to evaluate the company, we will use the methods that mentioned in chapter 2 to analyze the financial statement of the company during 2010 to 2014. The process of calculations will be all represented in this chapter.

The sixth chapter will make a summary of all the data

The last chapter will draw a conclusion about the financial condition in the Petro China Co during 2010 to 2014 and also make some comments for final analysis result.

2. Description of the financial analysis methods

This chapter describe the methods of financial analysis that will be used in this paper. Including Common-size analysis; financial ratio analysis; Pyramidal decomposition; etc. The theoretical background relief on the following resource: *Subramanyem and Wild (2013), Revsine and Collins (2014), Samoans (2015).*

2.1 Introduction of financial analysis

In order to have a better understanding of our company's financial situation, it is important for us to have the financial analysis. Financial analysis can be used as a comprehensive assessment of the financial situation undertaking which provides information on whether the firm is using its assets efficiently, whether it achieves the desired profit, whether it is able to meet its obligations in time, and many other important facts. Knowledge of financial status is desirable both in relation to the past as a feedback on whether the company has managed to meet his expectations or mistakes, but also used to forecast future developments. Therefore, it is establishing the weaknesses of company that could lead to problems and identification of strong stand to a possible revaluation of assets in the future. Financial analysis can be used both for the short term, and long-term decision making. In this case, managers need financial analysis, especially for long-term business management, which is to use the information gathered to make decisions about investment projects, financing long-term assets, in the compilation of financial plan, etc.

Financial analysis usually has 3 parts: 1. identification of basic indicators of financial situation. 2. Deeper analysis of causes of development. 3. Making draft of actions. In the Chapter 4, we will analyze the Petro China Co by using the methods which is introduced in this Chapter. In general, there are five common methods of financial analysis: Horizontal analysis; Vertical analysis; Ratio analysis; Decomposition of ratio; Sensitivity analysis.

2.2 Theoretical concept of financial analysis methods

A good financial analysis requires good techniques. In this section, we will explain the techniques of evaluating the financial data of the company. These techniques help us to understand the present and future financial performance and condition of the company. The technique includes:

2.2.1 Common-size analysis

Common-size analysis converts financial statement data to an easily comparable, or common-size, amount measured as a percent. This is done by making income statement items as a percent of net sales and balance sheet items as a percent of total assets, total liabilities and shareholders' equity. There are two main reasons to use common-size analysis: First, evaluating information from one period to the next within a company and the second is comparing the company with its competitors. There are two types of Common-size analysis which are horizontal common-size analysis, vertical common-size analysis.

Horizontal analysis

Horizontal analysis is also called common-base-year analysis. Horizontal analysis is a procedure that compares ratios or line items in a company's financial statements over a certain period of time and it can also compare the data with other company. It is a useful tool to evaluate the trend situations.

Horizontal analysis can be used for the statements have two or more periods. The earliest period is usually used as the base period and the items on the statements for other periods are compared with items on the statements of the base period. The changes are computed by using the following formulas:

$$\text{Absolute change} = i_n - i_{n-1} \quad (2.1)$$

$$\text{Reletive change} = \frac{i_n - i_{n-1}}{i_{n-1}} \quad (2.2)$$

i_n is value of the item in comparison year, i_{n-1} is value of the item in base year.

Horizontal analysis can be conducted for balance sheet, income statement, cash flow statement, etc. The absolute change helps us to see which value of item changes the most. The relative change can help us to compare the company's differences.

Vertical analysis

Vertical analysis is a popular method of financial statement analysis which shows each item on a statement as a percentage of a base item within the statement. The main advantages of vertical analysis are that every item in the statement can easily be compared. It also makes it easy to see relative annual changes within one business. Vertical analysis chooses a key item in the financial statement as a basic item and set it as 100%. Then calculate how many percentages that other items take. If we want to conduct a vertical analysis of income statement, sales figure is used as the base and all other components of income statement as cost of sales, gross profit, operating expenses, income tax, and etc. are shown as a percentage of sales. It is a very useful method in financial analysis. The way to calculate the proportion is use the amount of individual items divided by amount of basic item.

It is computed by using the following formula:

$$\text{Percentage of base} = \frac{i_n}{\varepsilon i_n} \times 100 \quad (2.3)$$

i_n is amount of individual item, εi_n is amount of base items.

2.2.2 Financial ratio analysis

Financial ratio analysis is another useful tool to analyze the company's financial

situation and performance. It is a mathematical comparisons of financial statement. These comparisons between the financial statement accounts can help investors, creditors, and internal company management understand how well a company is performing and which areas need to be improved. The reason that financial ratio analysis is the most common and widespread tool that used to analyze a business' financial standing is ratios are easy to understand and simple to compute. Financial ratio analysis doesn't take the size of a company into consideration. Financial ratio analysis is just a raw computation of financial position and performance. Financial ratio analysis can be divided into seven main categories: profitability ratio analysis; liquidity ratio analysis; solvency ratio analysis and asset management ratio analysis.

Profitability ratios

Profitability ratios show a company's ability to generate profits from its operations. These ratios basically show how well companies can achieve profits from their operations. In other words, profitability ratios can be used to determine whether companies are making enough operational profit from their assets. The higher the profitability ratios are; the better competitive position of the company take. Profitability ratios can be divided into 4 basic ratios:

1.! *Operating profit margin*

It is a profitability ratio that measures what percentage of total revenues is made up by operating income. In other words, the operating margin ratio represents how much revenues are left over after all the costs have been paid. In the other hand, this ratio shows what proportion of revenues is available to cover non-operating costs. This ratio is important because it helps show how strong and profitable a company's operations are. Here is the formula of operating profit margin:

$$\text{Operating profit margin} = \frac{\text{EBIT}}{\text{Revenues}} \left(or \ \frac{Operating\ profit}{Revenues} \right) \tag{2.4}$$

EBIT is earning before interest and tax.

2.! Net profit margin

Net profit margin is the revenue remaining after all operating expenses, interest, taxes and preferred stock dividends have been deducted from total revenue, typically expressed as a percentage. Net profit margins can generally be calculated as:

$$\text{Net profit margin} = \frac{\text{EAT}}{\text{Revenues}} \quad (2.5)$$

EAT is earning after tax.

3.! Return on assets

The return on assets ratio is a profitability ratio that measures the net income produced by total assets during a period which is comparing net income to the average total assets. Put another way, the return on assets ratio measures how efficiently a company can manage its assets to make profits during a period. The return on assets formula is calculated as following:

$$\text{Return on assets} = \frac{\text{EAT}}{\text{Assets}} \left(or \ \frac{EBIT}{Assets} \right) \quad (2.6)$$

EAT is earning after tax. EBIT is earning before interest and tax.

4.! Return on equity

Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested. It measures a firm's efficiency at generating profit from every unit of shareholder's equity which often shows as a percentage of shareholder's equity.

$$\text{Return on equity} = \frac{\text{EAT}}{\text{Equity}} \quad (2.7)$$

EAT is earning after tax.

Solvency ratios

Solvency ratios is also called leverage ratios which measure a company's ability to sustain operations indefinitely by comparing debt levels with equity, assets, and earnings. Solvency ratios show a company's ability to pay off its long-term obligations. Better solvency ratios indicate a more creditworthy and financially sound company in the long-term. These are the basic types of ratios:

1.! Debt ratio

Financial ratio is the measure of the extent of a company's or consumer's leverage. The debt ratio is defined as total assets financed by total debt which often expressed as a decimal or percentage. It can be interpreted as the proportion of a company's assets that are financed by debt. The higher debt indicates a higher risk, which is dangerous for the company.

$$\text{Debt ratio} = \frac{\text{total debt}(total\ liabilities)}{Assets} \quad (2.8)$$

2.! Debt-to-equity ratio

Debt to equity ratio is a liquidity ratio that compares a company's total debt to total equity. If debt to equity ratio is higher than one, the company uses more debt for assets financing than equity. In other words, a higher debt to equity ratio indicates that more creditor financing is used than investor financing.

$$\text{Debt to equity} = \frac{\text{total debt}(total\ liabilities)}{Equity} \quad (2.9)$$

3.! Interest coverage

Interest coverage is also called times interest earned. It is a financial ratio that measures a company's ability to make interest payments on its debt in a timely manner. We use this computation to understand the profitability and risk of a company. For example, when the ratio is lower than 1.5, this company may have problem to meet interest expense.

$$\text{Interest coverage} = \frac{\text{EBIT}}{\text{Interest paid}} \left(or\ \frac{Operating\ profit}{Interest\ paid} \right) \quad (2.10)$$

Liquidity ratios

Liquidity ratios shows a company's cash levels and the ability to turn other assets into cash to pay off liabilities and other current obligations. Liquidity is not only a measure of how much cash a company has. It is also a measure of how quick it will be for a company to raise enough cash or convert assets into cash. Assets as trading securities accounts receivable and inventory are relatively easy for company to

convert into cash in the short term. Thus, all of these assets will be used into the liquidity calculation of a company. There are three basic ratios:

1.! Current ratio

The current ratio measures a firm's ability to pay off its short-term liabilities with its current assets. A company only has a limited amount of time to raise the funds to pay for these liabilities. Current assets like cash and marketable securities can be easily converted into cash in the short term which means that companies with larger amounts of current assets will be more easily to pay off current liabilities.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} \quad (2.11)$$

2.! Quick ratio

Quick ratio shows the company's ability to meet current liabilities with its most liquid assets. It is more stringent test of company's liquidity. Higher quick ratio indicates a better liquidity of the company.

$$\text{Quick ratio} = \frac{current\ assets - inventories}{current\ liabilities} \left(or \frac{cash + accouns\ receivable}{current\ liabilities} \right) \quad (2.12)$$

3.! Cash ratio

It is a ratio that measures a company's ability to pay off its current liabilities with only cash and cash equivalents. The reason that cash ratio is much more restrictive than the current ratio or quick ratio is no other current assets can be used to pay off current debt but only cash. Usually, the required value of cash ratio is more than 0.2.

$$\text{Cash ratio} = \frac{Cash + Marketable\ securities}{current\ liabilities} \quad (2.13)$$

Asset management ratios

Asset Management Ratios are also called activity ratios. It attempts to measure the firm's ability to manage its assets to generate sales. Therefore, these ratios can provide insight into the condition of the firm's credit policy and inventory management. There are four basic types of activity ratios:

1.! Average collection period

Average collection period is computed by dividing the number of working days for a

given period by receivables turnover ratio. It measures the conversion of accounts receivable into cash, how long it takes to satisfy the company's receivables. A short collection period means the better management of receivables. A longer collection period may have negative effect on the company's short-term debt paying ability.

$$\text{Asset Management Ratios} = \frac{account\ receivables}{credit\ sales} \times 360 \quad (2.14)$$

2.! Accounts receivable turnover

Account receivable turnover shows the total revenues to average accounts receivable. It measures how many times a company can turn its accounts receivable into cash during a period. A turn based on each time a company own its average receivables. Account receivable turnover ratio shows how efficient a company is when collecting its credit sales from customers.

$$\text{Account receivable turnover} = \frac{Credit\ sale}{Account\ receivables} \quad (2.15)$$

3.! Inventory turnover

Inventory turnover indicates the efficiency of the company to use inventory. It measures how many times average inventory is "turned" or sold during a period. Total turnover depends on the performance of two main components. They are stock purchasing and sales. If we purchased larger amounts of inventory a during the year, the company will have to sell larger amounts of inventory to improve its turnover. If the company can't sell these amounts of inventory, it will incur holding costs. In the other hand, sales have to match inventory purchases otherwise the inventory will not be effectively.

$$\text{Inventory turnover} = \frac{Costs\ of\ goods\ sold}{Average\ inventory} \quad (2.16)$$

4.! Total assets turnover

Total assets turnover is an efficiency ratio that shows how well the company is managing its assets to generate revenue. The higher ratio the better. Total assets turnover is 1.5 means each unit invested in assets generates revenues of 1.5.

$$\text{Total assets turnover} = \frac{\text{Revenues}}{\text{Assets}} \quad (2.17)$$

2.2.3 Pyramidal decomposition

Pyramidal decomposition measures to analyze what drives the value of financial ratios. In chapter 4, we will use the pyramidal decomposition of ROE. It is an effective way to find out the reason that ROE changes of the company during a period.

$$\text{ROE} = \frac{Net\ profit}{Equity} = \frac{EAT}{Revenues} \times \frac{Revenues}{Asset} \times \frac{Asset}{Equity} \tag{2.18}$$

In order to analyze whose change have caused change in the basic ratio, we use methods of influence quantification. There are four methods for quantification of influence:

1.! *Method of gradual changes*

Method of gradual changes is used to quantify the change in the basic ratio caused by the component ratio. In this case, the decomposition has 3 component ratios:

$$\begin{aligned} \Delta x_{a1} &= \Delta a_1 \times a_{2.0} \times a_{3.0} \\ \Delta x_{a2} &= a_{1.1} \times \Delta a_2 \times a_{3.0} \\ \Delta x_{a2} &= a_{1.1} \times a_{2.1} \times \Delta a_3 \end{aligned} \tag{2.19}$$

x is basic ratio; Δx is absolute change in the basic ratio; a is component ratio; Δa is absolute change in component ratio; Δx_{ai} is absolute change in the basic ratio caused by the change in the first component ratio.

2.! *Logarithmic decomposition method*

The advantage of this method is it only has one formula for the impact quantification no matter how many components we have.

$$\Delta x_{a1} = \frac{\ln I_{a1}}{\ln I_x} \times \Delta x \tag{2.20}$$

x is basic ratio; Δx is absolute change in the basic ratio; $I_x = \frac{x_1}{x_0}$ is index of change in basic ratio; $I_a = \frac{a_1}{a_0}$ is index of change in the component ratio

3.! *Functional decomposition method*

Functional decomposition method works with the relative changes in component and

basic ratios. It applicable no matter the signs of the relative changes.

$$R_x = \frac{x_1 - x_0}{x_0} \quad R_{ai} = \frac{a_1 - a_0}{a_0}$$

$$\Delta x_{a1} = \frac{1}{R_x} \times R_{a1} \times \left(1 + \frac{1}{-} R_{a2} + \frac{1}{-} R_{a3} + \frac{1}{3} R_{a2} \times R_{a3}\right) \times \Delta x$$

$$\Delta x_{a2} = \frac{1}{R_x} \times R_{a2} \times \left(1 + \frac{1}{-} R_{a1} + \frac{1}{-} R_{a3} + \frac{1}{3} R_{a1} \times R_{a3}\right) \times \Delta x$$

$$\Delta x_{a3} = \frac{1}{R_x} \times R_{a3} \times \left(1 + \frac{1}{-} R_{a2} + \frac{1}{-} R_{a1} + \frac{1}{3} R_{a2} \times R_{a1}\right) \times \Delta x$$

2.2.4 Sensitivity analysis

Sensitivity analysis is an important measure to identify impact on investment projects economic indicators from a number of sensitive factors of uncertainty factors, and analysis which estimates the impact of the project and the degree of sensitivity of economic indicators, and then judge the project uncertain risk affordability analysis. Sensitivity analysis helps to determine which risks have the greatest potential impact on the project. It is all the other uncertainties kept at the reference value, each of the elements of uncertainty to inspect the project to have much impact on the target level.

3. Comparison of the history and present financial situation

This chapter focus on introduce Petro China Co. There will be introduction and history financial condition of this company.

3.1 Introduction of Petro China Co

Petro China Co is a state-owned backbone enterprise, this company has the oil and gas business, engineering and technical services, Petroleum engineering construction, equipment manufacturing, financial services, new energy development and so on for as the main business of integrated international energy company. It is one of the main oil and gas producer and supplier in China. In 2014, in the world's 50 most oil companies ranked third, integrated in the fortune global 500 big companies ranked fourth. China petroleum to build world-class integrated international energy company as the goal, through the implementation of strategic development, insist on innovation drive, pay attention to the quality benefits, accelerate transformation of the mode of development, the main indicators by 2020 reached the world advanced level, improve competitiveness and profitability, become the leading company for green development and sustainable development.

The main businesses of Petro China Co are:

1.! Exploration and production company

In 2016, the company will focus on oil and gas exploration is based on the domestic song Liao, ordos, Sichuan and other major oil and gas basin, oil and gas reserves continue to grow, to further consolidate the foundation of oil and gas resources of the business development.

2.! Oil and gas exploration

In 2015, the company added probing geologic reserves of oil 715 million tons, domestic new proven geological reserves of 487.9 billion cubic meters of natural gas, has proven reserves of oil and gas equivalent of more than 1 billion tons. New oil and

gas reserves is given priority to with lithologic reservoirs, low permeable reservoirs, the overall buried deep, but large scale and can be used.

3.! Development and production

The domestic oil and gas production running smoothly. Companies continue to intensify the building of the new capacity, adhere to the principle of the new oil field overall development, advance the standardization of construction on the ground, the new well single-well production year-on-year rise. In-depth development through careful management, advance the old oilfield water injection measures, such as special governance main development index continued improvement, increased to 72% of the reserves producing degree of water flooding, old well natural decline rate fell by 1.6%, water cut rising rate controlled within 0.5%. Horizontal well and underbalanced drilling and reservoir transformation such as mature technology and special application of appropriate technology, to improve drilling speed, stability and improve the single well production and improve the efficiency and benefit of oil and gas field development has played an important role.

4.! China national petroleum corporation sales

Sales business is the company's service terminal consumers, promote the brand value is an important window. Through continuous optimization of the marketing network layout, and continuously improve service quality and efficiency, efforts to ensure stable supply of domestic oil product market.

5.! China national petroleum corporation natural gas pipeline

Natural gas and pipeline business is one of the core business of petro china's most growth. Companies adhere to the "oil and gas simultaneously", speed up the development of natural gas business, meet the national energy consumption structure adjustment direction, also is the realistic way to promote the development of green.

6.! The international trade

In 2015, the international trade business continued to maintain rapid development situation, operation scale continues to expand. Companies actively conducting oil futures, and refined products, processing, mixing, transportation, wholesale, retail business, huge growth business benefit. The annual trade volume of 250 million tons,

up 29.1%; Implement trade volume of $192.1 billion.

7.! Science and technology innovation

In 2016, the company aimed at restricting the oil and gas exploration and refining chemical and other main business key bottlenecks in the development of technology, has launched a series of technical research, and made positive progress and achievement, the company will further enhance our capacity for independent innovation, to promote the main business rapid development provides a powerful technical support and guarantee.

3.2 Situations from different years in general

In 2014, is the company's development in the highly unusual and challenging year. With the complex internal and external development. Environment, the company firmly grasp the general trend, and always maintain composure, adhere to the quality benefits sustainable development policy, highlight the focus on development Main business of oil and gas, vigorously implement the open source throttling authors efficiency, stable production and operation controlled and good operating performance. Profit total income of 2.73 trillion yuan, 173.4 billion yuan, pay taxes and fees for 427.6 billion yuan.

In 2013, the company meet internal and external risks and challenges calmly, adhere to the implementation of resources, market and internationalization strategy, as a whole two resources and two markets at home and abroad, focus main business of oil and gas, pay attention to improve the quality and efficiency of development, to achieve the production and business operation Stable and positive, performance is superior to the general trend of the industry. The annual business income is 2.76 trillion yuan, achieved

Profit total 188 billion yuan, 407.8 billion yuan of taxes and fees payable year-on-year growth of 2.8%, respectively, 2.2% and 3.8%

In 2011, in the face of the complex macroeconomic situation, the group organization of production and business operation smoothly, speed up the change of the pattern of

economic development, domestic Fruitful business all-round development, overseas strategy, the value of the company steadily improving, turnover RMB 20038.43 one ten billion yuan, rose 36.7%. The domestic refined oil prices macroeconomic regulation and control, imported gas net selling price and tax growth factors, such as large in 2011. The group's net profit attributable to the parent company shareholders to 1329.61 one hundred million yuan, down 5.0% year-on-year.

In 2010, the group pre-tax profit of RMB is 1891.94, year-on-year growth of 35.4%; Net profit attributable to the parent company shareholders to end at 13980 billion yuan, a year-on-year growth of 35.6% over the same; Basic earnings per share for the 0.76 yuan. According to international financial reporting standards, in 2010 the group pre-tax profit of RMB 1893.05 one hundred million, year-on-year growth 35.2%; Attributable to the parent company shareholders net income of RMB 1399.92 one hundred million yuan, 35.4% higher than a year ago.

The company will adhere to the dedicated energy adhere to the resources, market, internationalization strategy, international oil, sustainable, green, make full use of two resources and two markets, ensure national energy security, ensure the steady supply of oil and gas market, for the society to provide quality safe and clean the oil and gas products and services.

4. Financial analysis of the Petro China Co. Ltd

This chapter analyze the financial situation of the Petro China. Co. Ltd. It has four main parts: common-size analysis, financial ratio analysis, decomposition of ROE, sensitivity analysis.

4.1 Common-size analysis

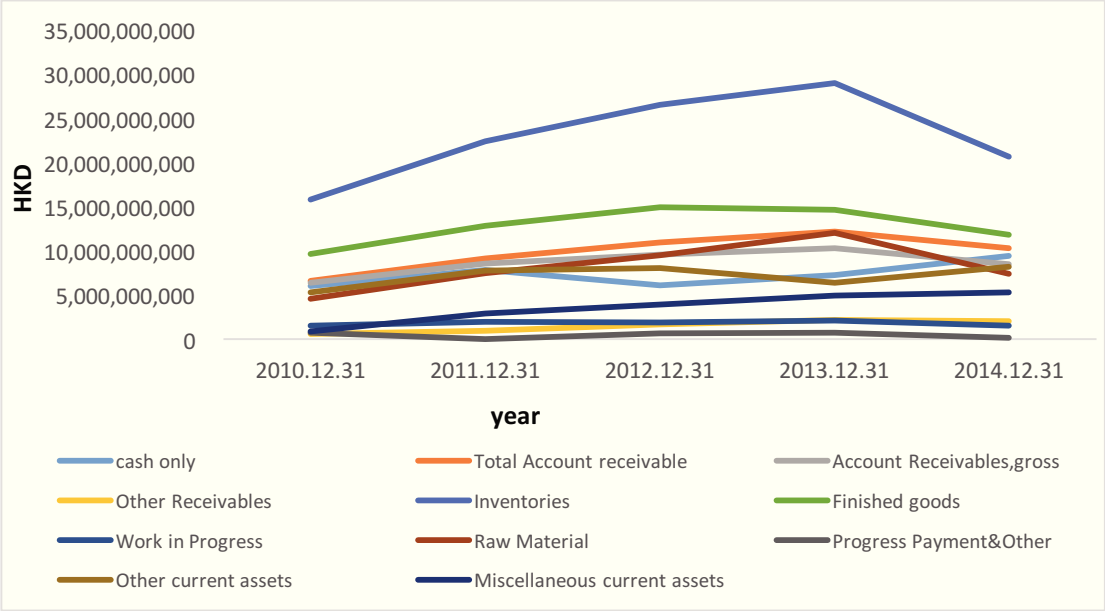
It's the analysis of financial statements data and their changes over the time. Common-size analysis aims to identify the trends and major differences in the financial statements during a period. There are two types of Common-size analysis, which are horizontal common-size analysis, vertical common-size analysis.

4.1.1 Common-size analysis of balance sheet

Horizontal analysis

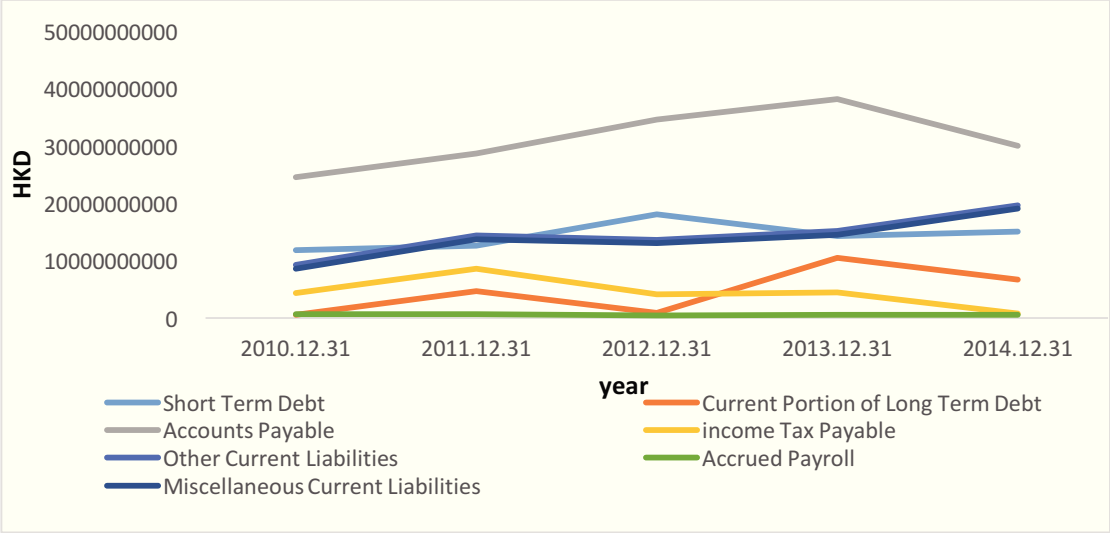
Horizontal analysis of balance sheet analyzes the changes of balance sheet data over 2010-2014

Chart4.1 Growth trend of current assets 2010-2014



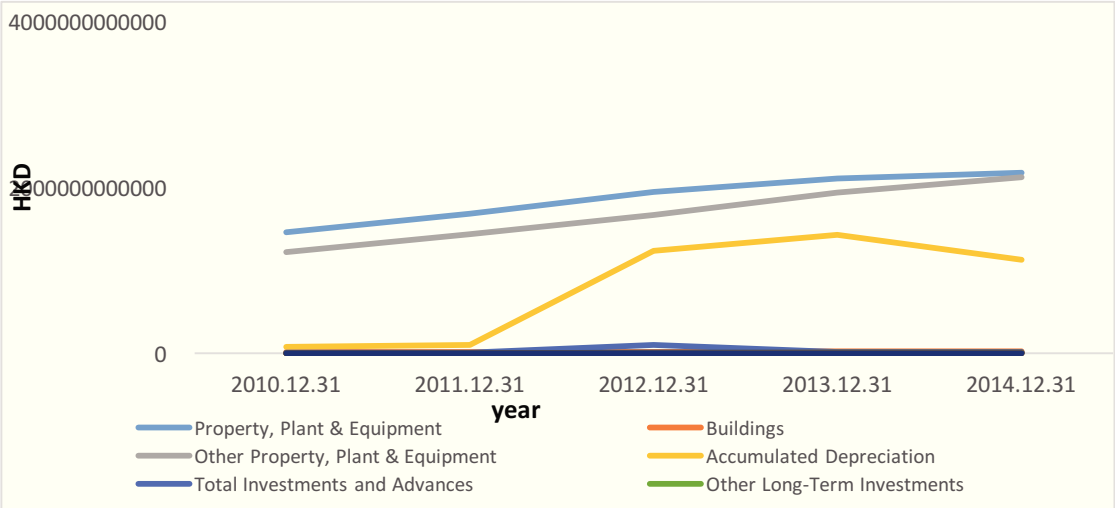
We can see in the Chart 4.1, most items increasing during 2010-2013 and decreasing in 2013-2014, especially the cash, account receivable and raw material. Finished goods increased in 2010-2012, remain stable in 2012-2013, after 2013, it deceased. Progress payment &Other, other receivables, working in progress are very stable, only have little fluctuation in 2010-2014.

Chart 4.2 Growth trend of current liabilities



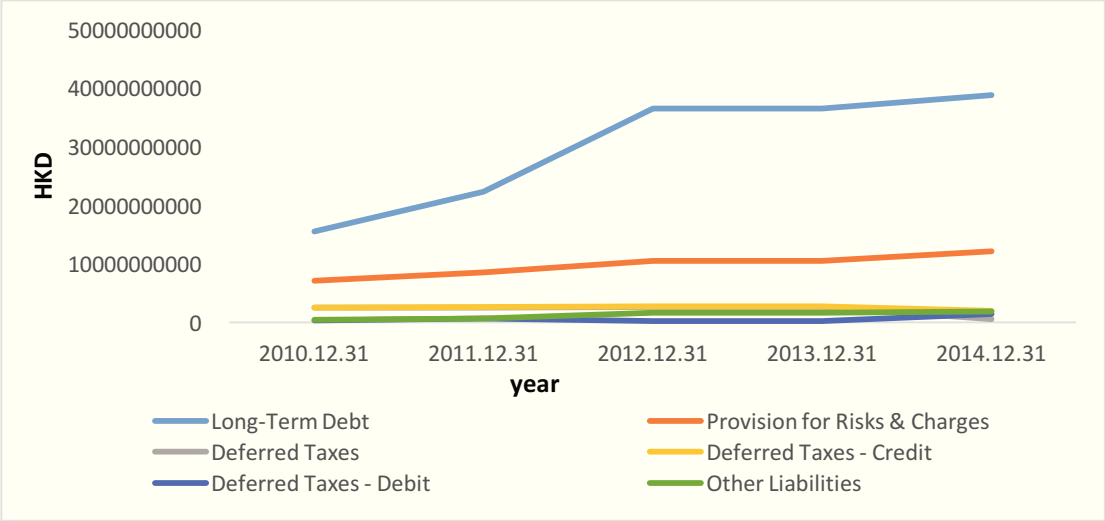
As is showed in Chart 4.2, account payable increased in 2010-2013, decreased during 2013-2014.In general, other current liabilities go up during 2011-2014.Short-term debt reached its biggest amount in 2012, it decreased during 2012-2013, but it still increases during 2010-2014.Income tax payable decrease during 2010- 2014, it only increased in 2010-2011.Accrued payroll hardly changed in this five years.

Chart4.3 Growth trend of fixed assets



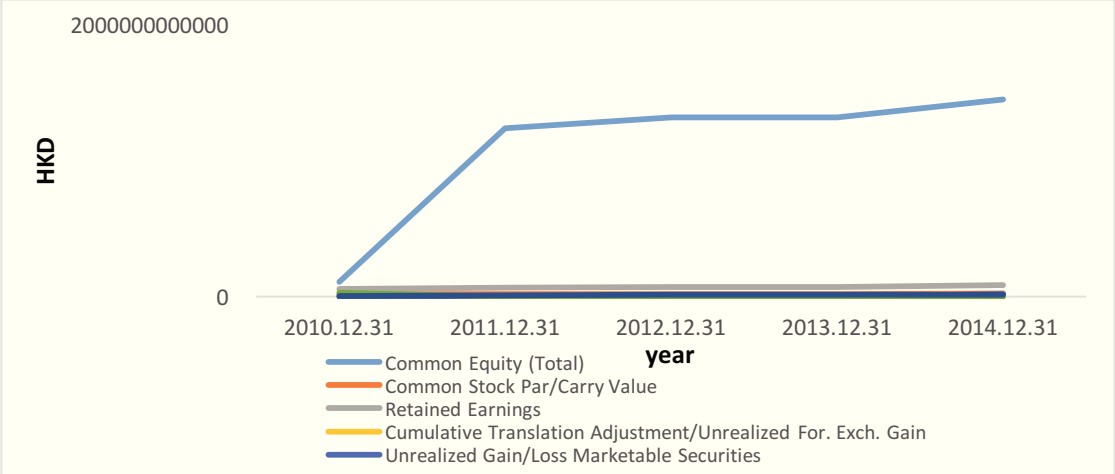
All the Property, Plant & Equipment become more and more in this five years. About the deprecation, it's steady through 2010-2011, but has a sharply raising during 2011-2012, then it grows slowly in 2013, eventually it decreased during 2013-2014.Investments and advances only increased in 2011-2012, and came back it used to be in 2012-2013.Meanwhile, intangible assets, tangible other assets, buildings, net goodwill are stay the same during five years.

Chart.4.4 Growth trend on other liabilities



For other liabilities, only long-term debt increased during 2010-2012, and it's barely changed during2012-2014.As is showed in the chart, other items belong to other liabilities aren't change a lot.

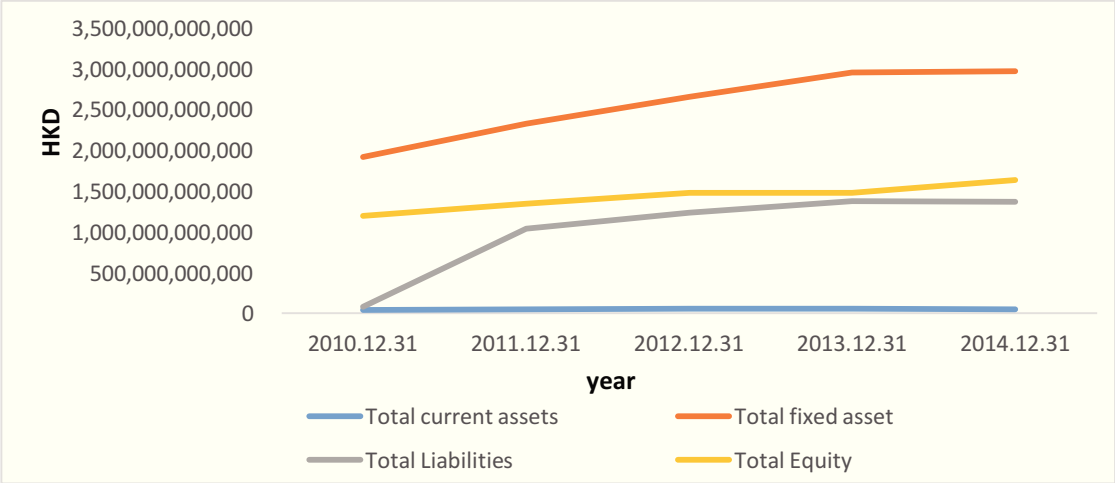
Chart 4.5 Growth trend on shareholder's equity



It's very similar to the last chart. Only common equity increased during 2010-2011.

For other liabilities, only long-term debt increased during 2010-2012, and it's barely changed during2012-2014.

Chart 4.6 Growth trend of assets, equity, liabilities

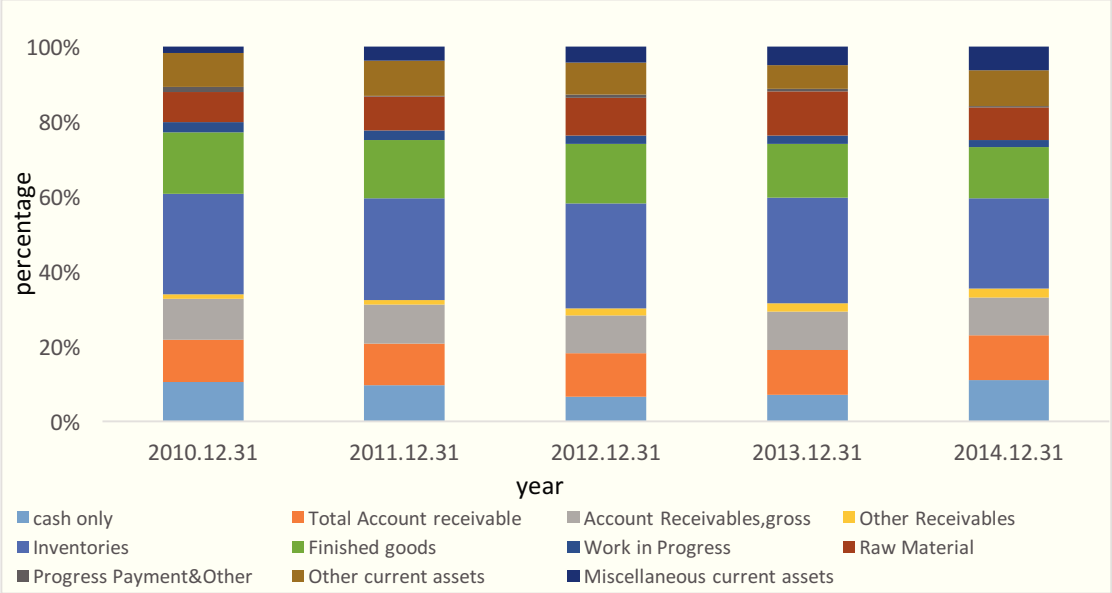


In the chart 4.6, we can see the changes of balance sheet very clearly. Total current assets have approximately no changes during 2010-2014.Total equity assets has a small raising during2010-2012 and 2013-2014.Total liabilities increased a lot during 2010-2011, and increased slowly during 2011-2013, cool down during 2013-2014.Total fixed asset stay increased during 2010-2013 and hold on that number during 2013-2014.

Vertical common-size analysis

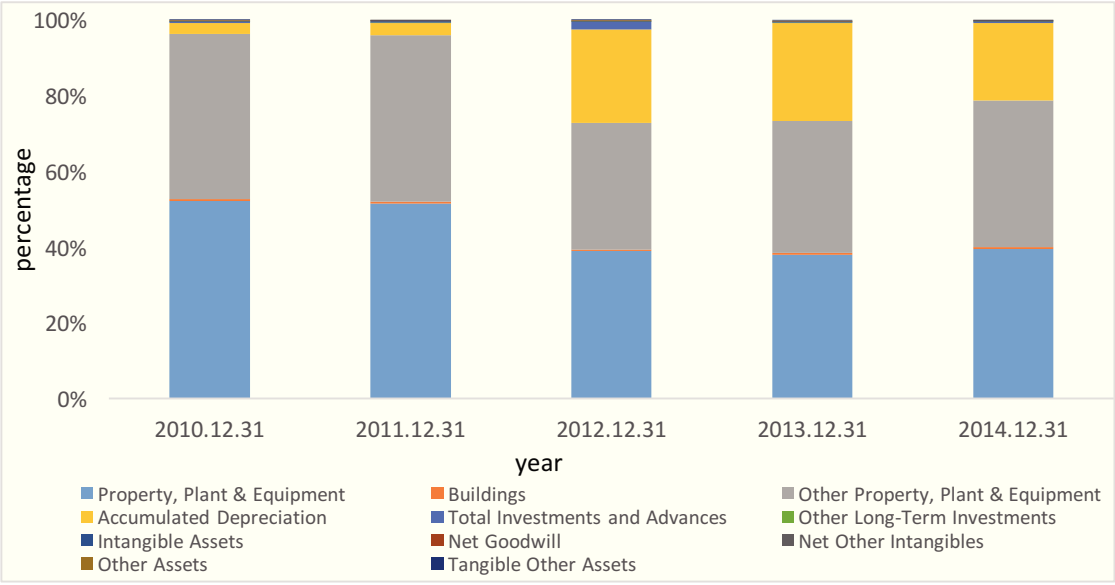
It analysis of the changes in the proportion of selected benchmarks (total revenues, total assets, total liabilities, etc.). Vertical analysis is a popular method of financial statement analysis which shows each item on a statement as a percentage of a base item within the statement. The main advantages of vertical analysis are that every item in the statement can easily be compared. It also makes it easy to see relative annual changes within one business. We will use vertical common-size method to analyze the balance sheet of Petro China Co, in order to understand the company's financial condition better.

Chart 4.7 Structure analysis of current asset



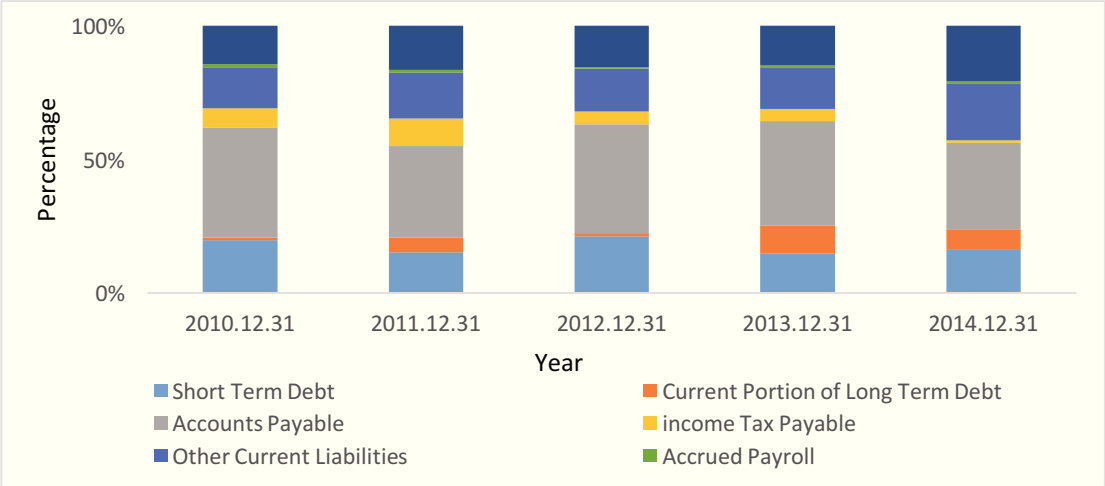
In chart 4.7, we can observe that inventories plays a big part in the current assets, the proportion of the inventories increased during2010-2012, decreased to its smallest proportion 20% during 2013-2014. The proportion of total account receivable are almost the same during those five years. The proportion of cash decreased during 2010-2012, then it gets better during 2012-2014, in 2014, it's proportion is higher than the proportion in 2010.Other current assets, progress payment only plays small part in current assets in those five years.

Chart 4.8 Structure analysis of fixed asset



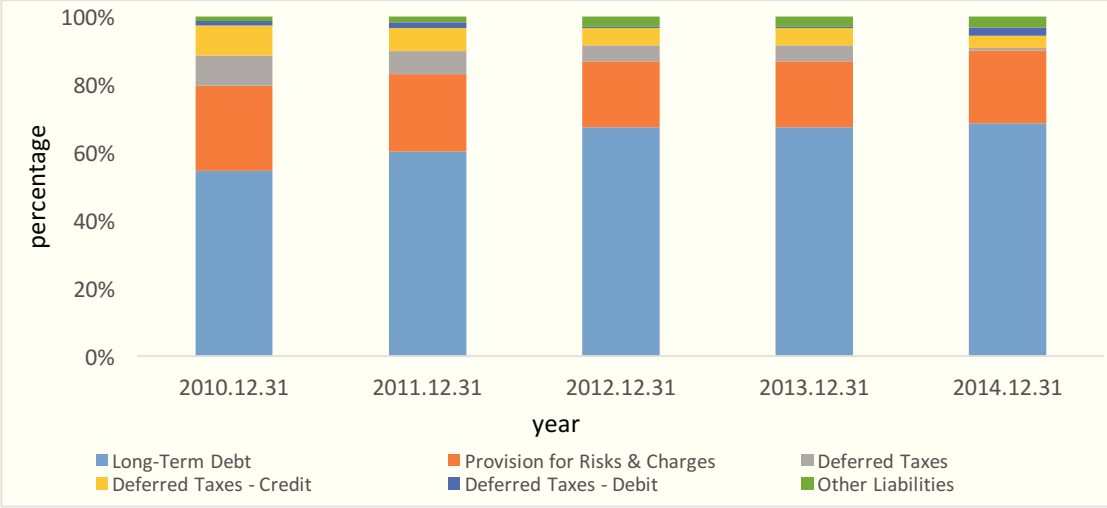
In chart 4.8, property, plant & equipment play huge role in fixed assets, the proportion of depreciation is approximately 5 % in 2010 and 2011, however, the depreciation increases a lot during 2012-2014, the proportion of it raised near to 30%. And the proportions of the buildings, tangible assets, goodwill, intangible assets hardly changed in these years, because the amount of the proportions are very small.

Chart 4.9 Structure analysis of current liabilities



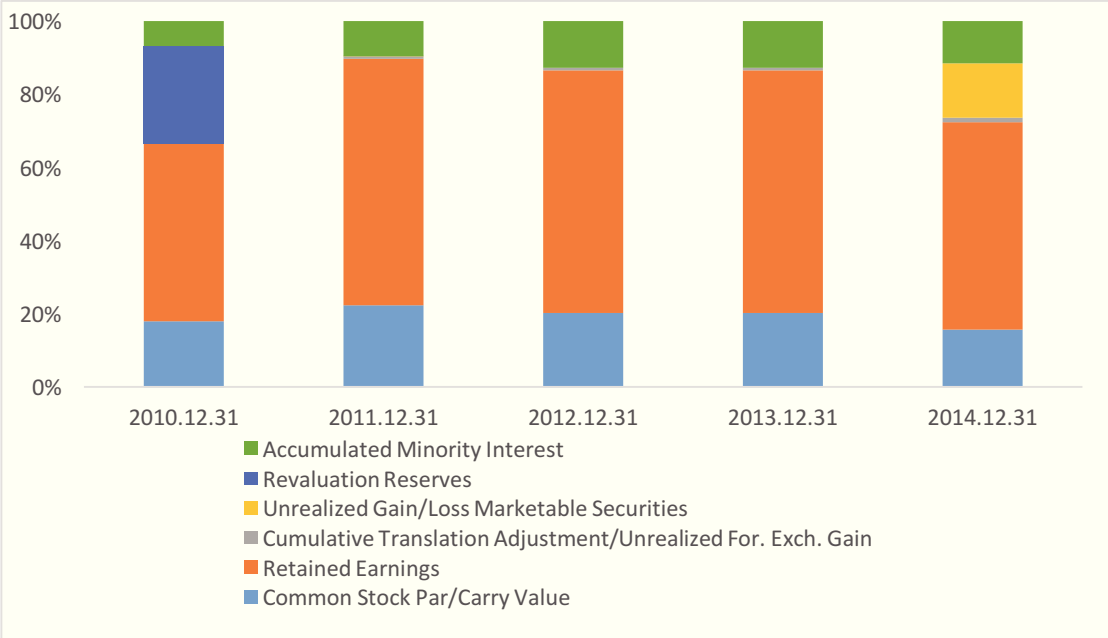
In this chart, it is clear that accounts payable is the biggest part in the current liabilities, but during 2010-2011, the proportion of current liabilities dropped almost 10%, it recovered in 2012 and 2013, however decreased to 33% during 2013-2014.Comparing the proportions of short term debt in 5 years, the biggest amount is in the 2012, and decrease during 2012--2014.

Chart 4.10 Structure analysis of other liability



It is obvious long-term debt play the largest part in other liabilities, it increases every year during 2010-2012 and remain stable in 2013, 2014.The proportion of taxes decreased year by year and only have 3% in 2014.

Chart 4.11 Structure analysis of equity



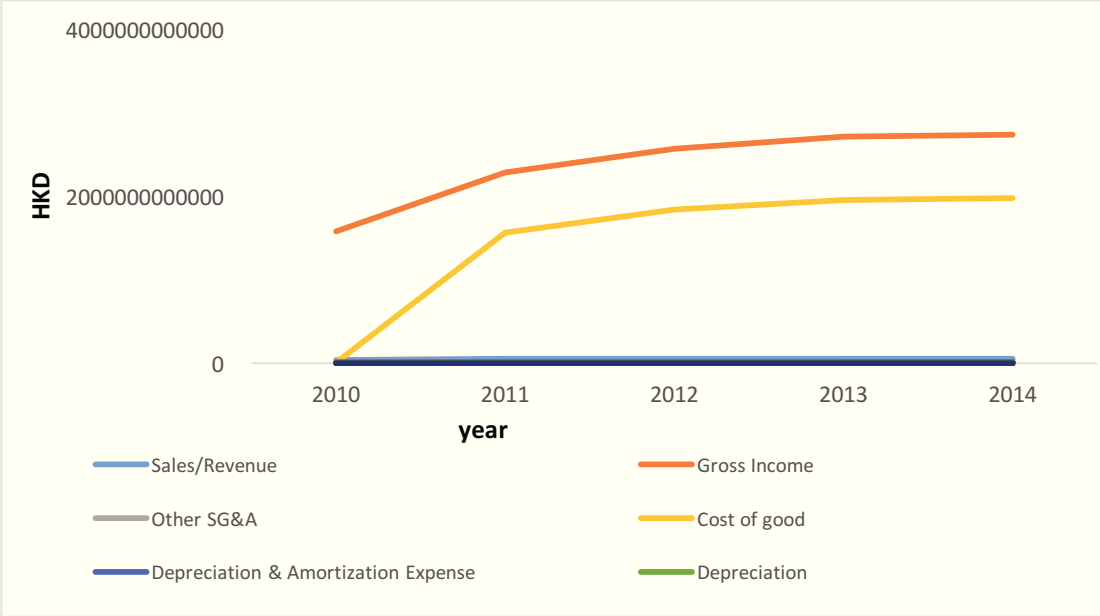
As is showed in the chart, the proportion of accumulated minority interest increased during 2010-2013, and decrease a little in 2014.The proportion of revaluation reserves only have 28% in 2010, it hardly takes part during 2011-2014.Retained earnings always have the biggest amount in five years. It only has 50% in 2010, increase to 68% in 2011 and remain high percentages until 2013, then decrease to 54% in 2014.About the proportion of common stock, which have the largest in 2011, and only change little in other five years. The proportion of accumulated minority interest keep growing during 2010-2012, after that it decrease year by year till 2014.

4.1.2 Common-size analysis of income statement

Horizontal analysis

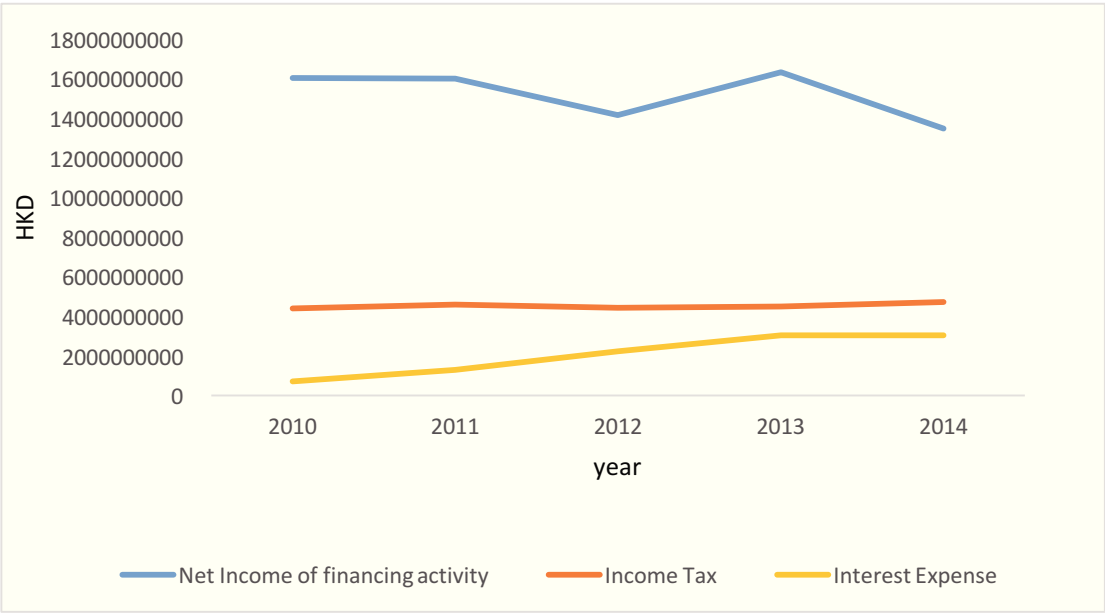
Horizontal analysis of income statement analyzes the changes of income statement data over 2010-2014

Chart 4.12 Growth trend of items in operating activity



As it can be seen from the chart, the main items of operating activity have the roughly same change tendency. The costs in operating activity hardly change during 2010-2014, in the other hand, the income of operating activity increase sharply during 2010-2011, then slowly increase every year in 2011 to 2014.

Chart 4.13 Growth trend of items in financing activity

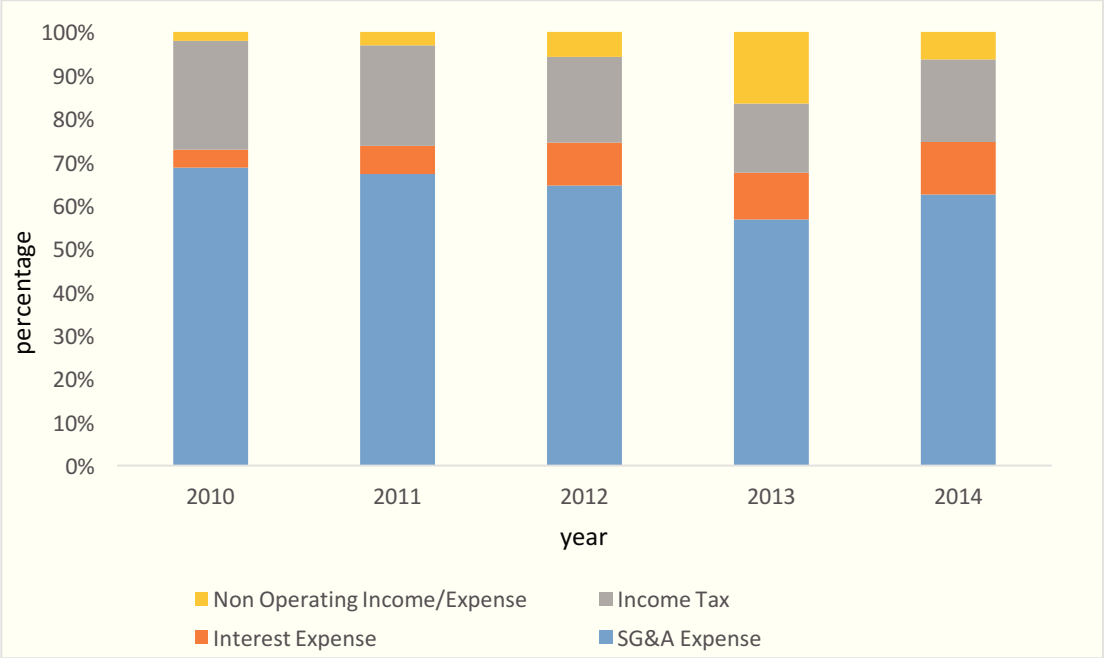


We can observe that income tax is a straight line basically. Interest expenses on financing activity increase slightly during 2010-2013, then become steady during 2013-2014.Net income is more likely an up and down situation in these five years.

Vertical common-size analysis

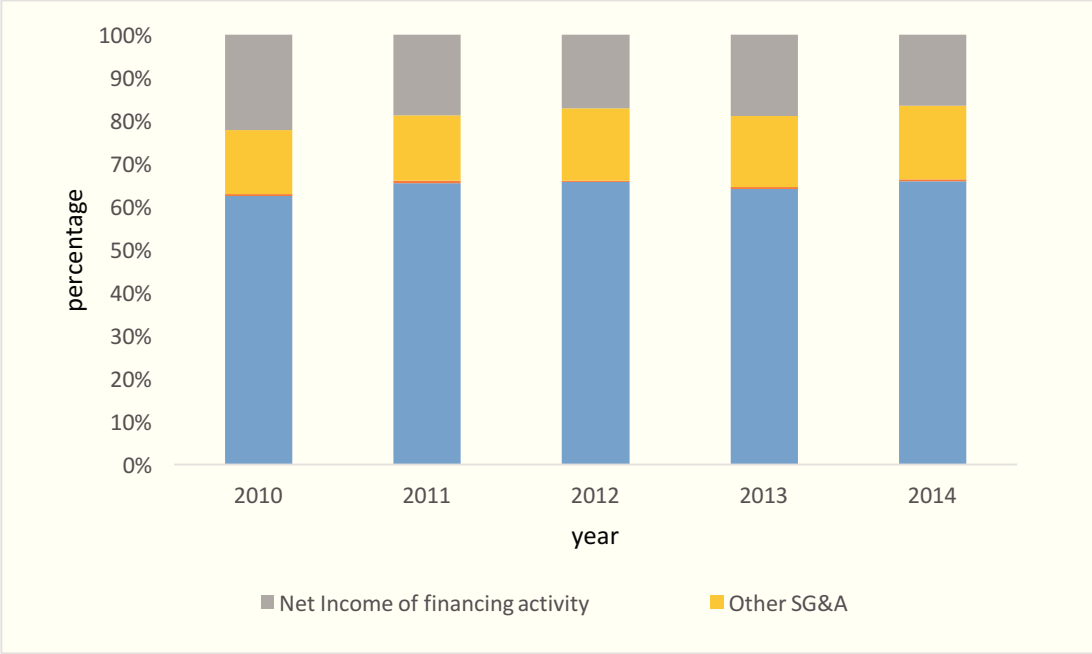
It analysis of the changes in the proportion of selected benchmarks (total revenues, total assets, total liabilities, etc.) in income statement. It helps us to understand which items costs the company more, so we can make procedures to change that situation and decline the expense of our company,

Chart 4.14 Structure analysis of costs



The total expenses including: non-operating expense, income tax, interest expense, SG&A expense. As is showed in the chart, SG&A expense takes up the majority percentage of total expenses over 60%, except in 2013.The income tax takes up the second largest part. In 2010, the income tax plays the maximum part of expenses, and the minimal part of expenses in 2013.About non-operating expense and interest expense, they both become maximization in 2013 and minimization in 2010.The non-operating expenses is only take 5 % of all the expenses at the first year then increase to 20% in 2013, the income tax takes around 20% in the whole amount of expense. Interest expense is the smallest in the expenses, the largest proportion is around 15%.

Chart 4.15 Structure analysis of income



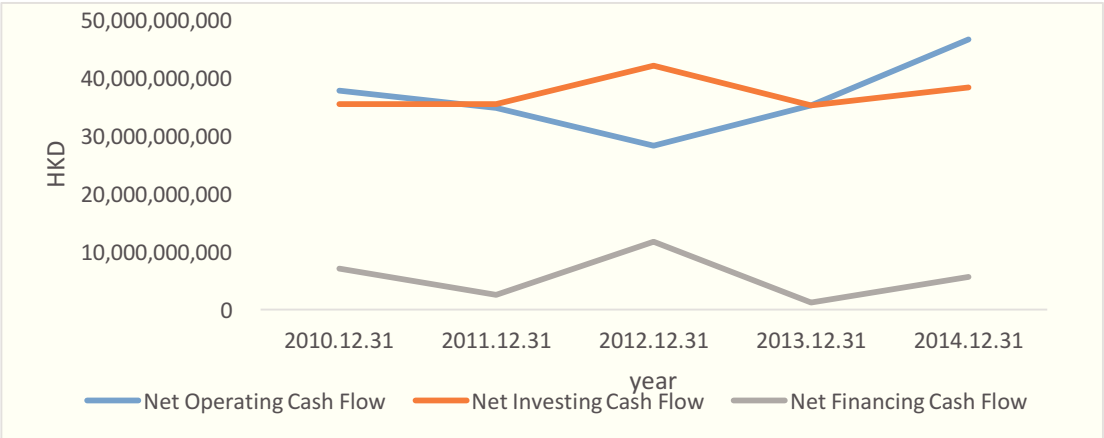
It can be seen from the graph the Sales takes over the majority in income over 65% in the fiscal 2010 to 2014.The proportion of Non-operating interest income are nearly invisible in the fiscal 2010 to 2014.The proportion of net income of financing activity has largest amount in 2010 and smallest in 2012.

4.1.3 Common-size analysis of cash flow statement

Horizontal analysis

Horizontal analysis of cash flow statement analyzes the changes of balance sheet data over 2010-2014.

Chart 4.16 Growth trend of cash flow from different activities



The cash flow has three parts: net operating cash flow, net investing cash flow, net financing cash flow. .Net operating cash flow decrease during 2010-2012 and has its lowest trend in 2012, then it's come back to life, increase during 2012-2014 and remain growing as the trend showed.Net investing cash flow increase during 2011-2012,2013-2014, and decrease during 2012-2013.Net financing cash flow has a interesting situation. It decreases during 2010-2011 then increases during 2011-2012however drop to the lowest spot in 2013, after that, during 2013-2014 it increases to the same amount in 2010.There are the trends of cash flow of different activities.

Chart 4.17 Trends of outflow in operating activity

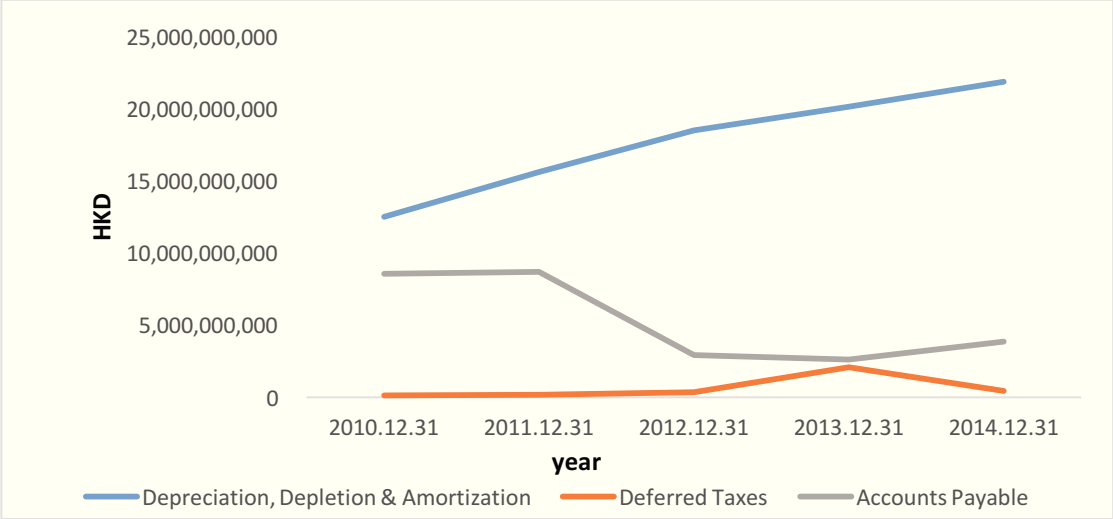
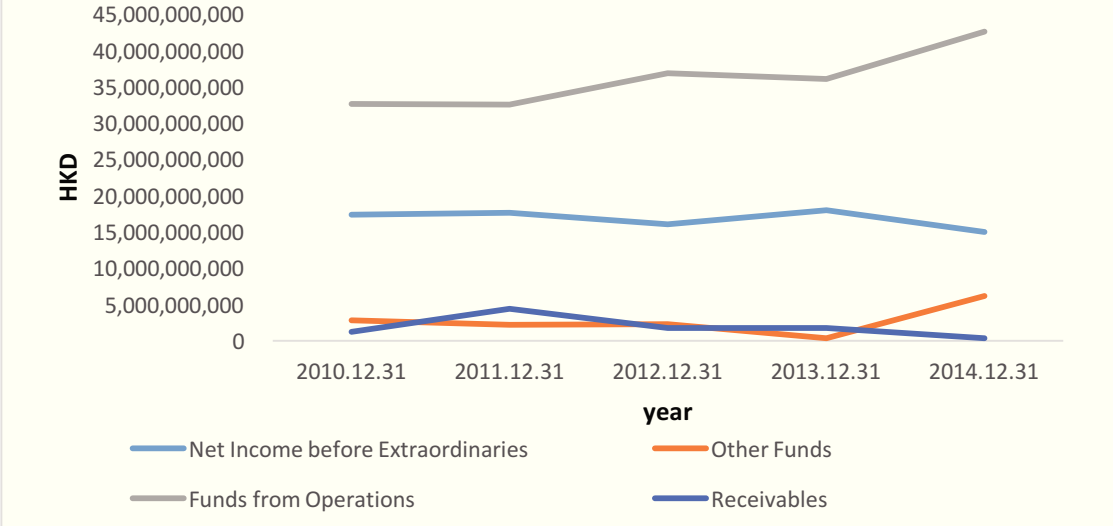


Chart 4.18 Trends of inflow in operating activity



In the graph, we see that comparing to the inflow, the expenses have more changes. The depreciation grows every year; the good thing is accounts payable decreased. In general, the inflows increase small amount. Binding chart 4.16, the net cash flow of operating activities has the smallest amount in 2012.

Chart 4.19 Trend of outflow in investing activity

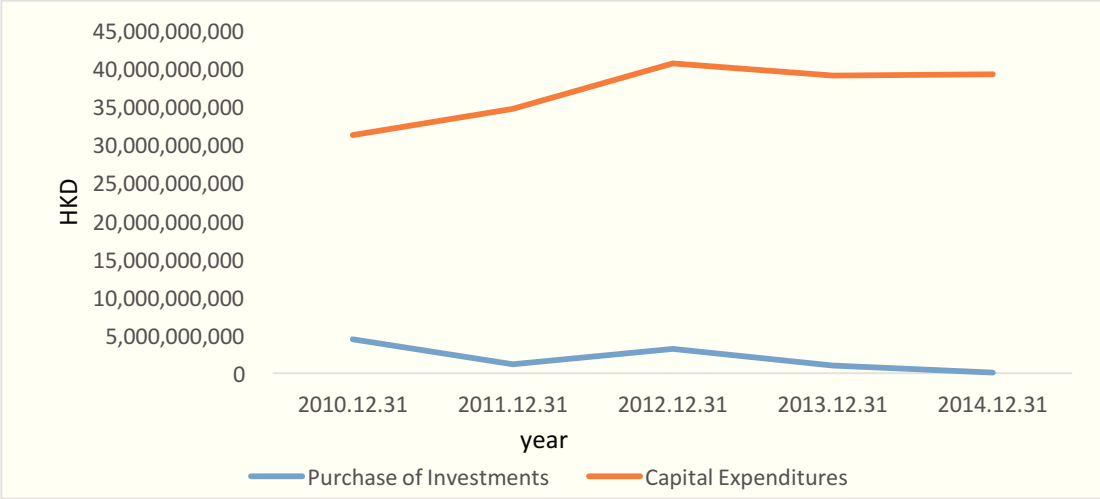
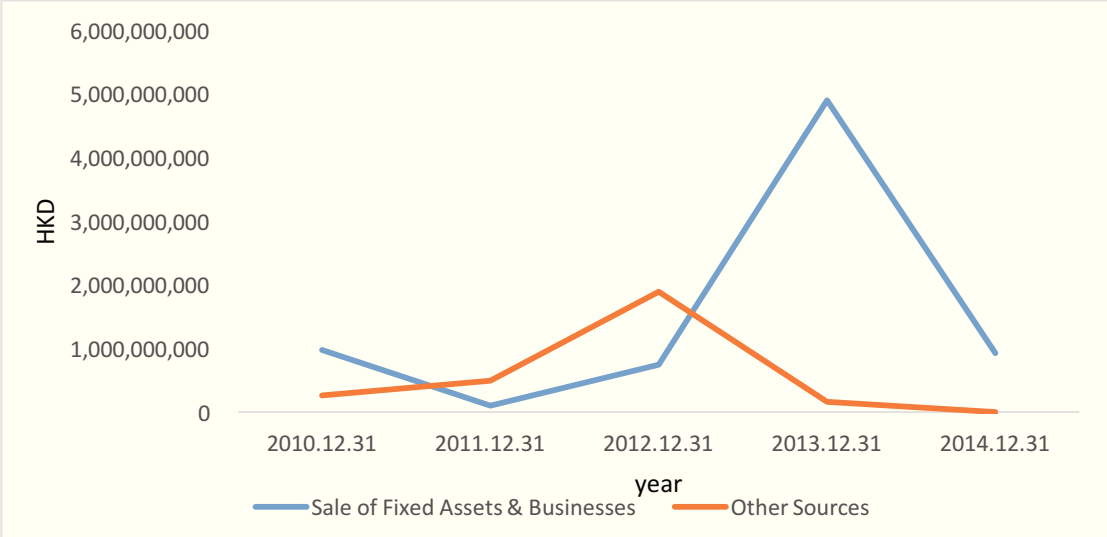


Chart 4.20 Trend of inflow in investing activity



The items of investing activity are less than operating activity and financing activity. It can be seen in the graph, the sales of fixed assets & businesses increased a lot during 2012-2013.In general, the largest expenses are in 2012, but the income of other sources also perform good in 2012.That is the reason, net investing cash flow increase during 2011-2012,2013-2014, and decrease during 2012-2013.

Chart 4.21 Trend of outflow in financing activity

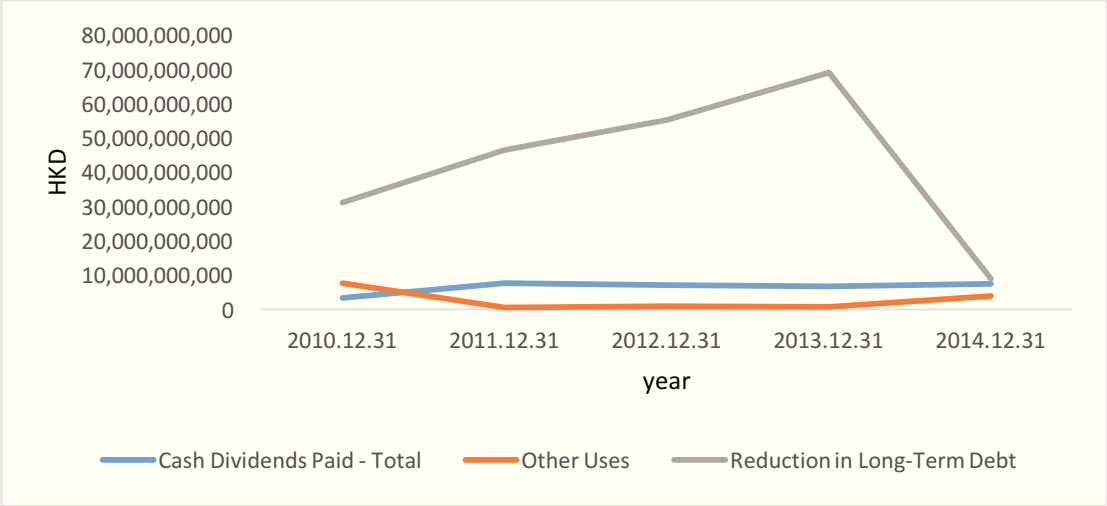
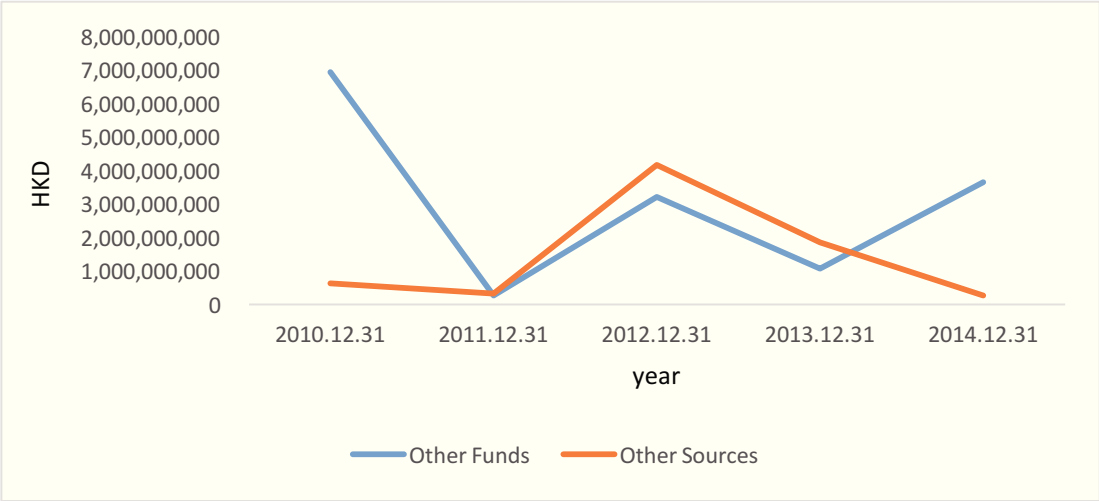


Chart 4.22 Trend of inflow in financing activity



In the chart the expenses hardly change. However, the incomes change a lot. The cash flow from funds is very unstable, increase year decrease year. The income from other sources increase during 2011-2012, decrease during 2012-2014. So the cash flow of financing activity decreases during 2010-2011 then increases during 2011-2012however drop to the lowest spot in 2013, after that, during 2013-2014 it increases to the same amount in 2010.The items in the financing activity are less than the items in other two activities, but it is still a very important part of the cash flow statement.

Vertical common-size analysis

It analysis of the changes in the proportion of selected benchmarks (total revenues, total assets, total liabilities, etc.) in cash flow statement.

Chart 4.23 Structure of outflow in operating activity

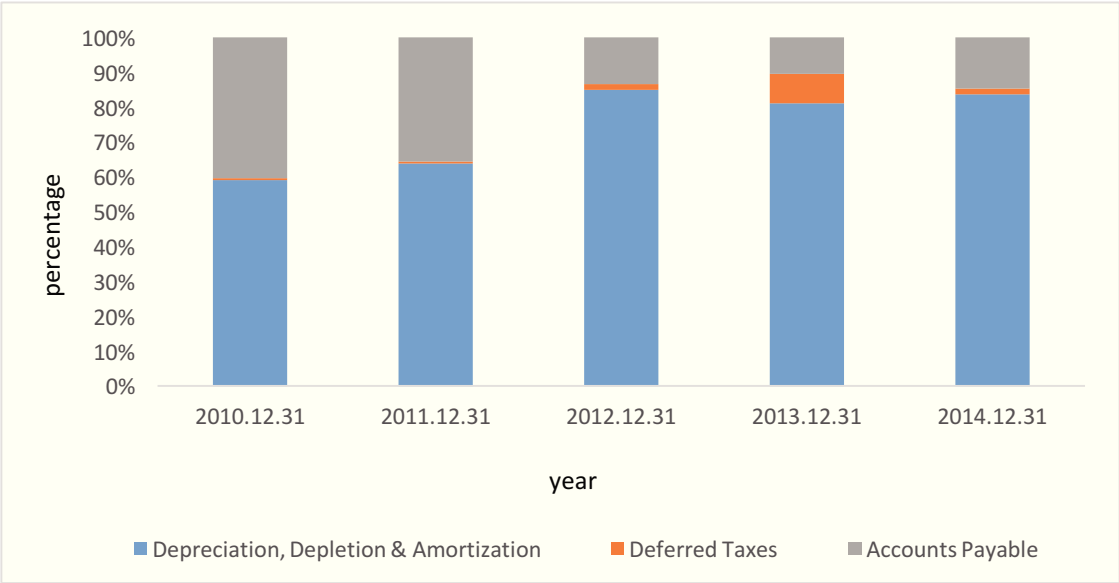
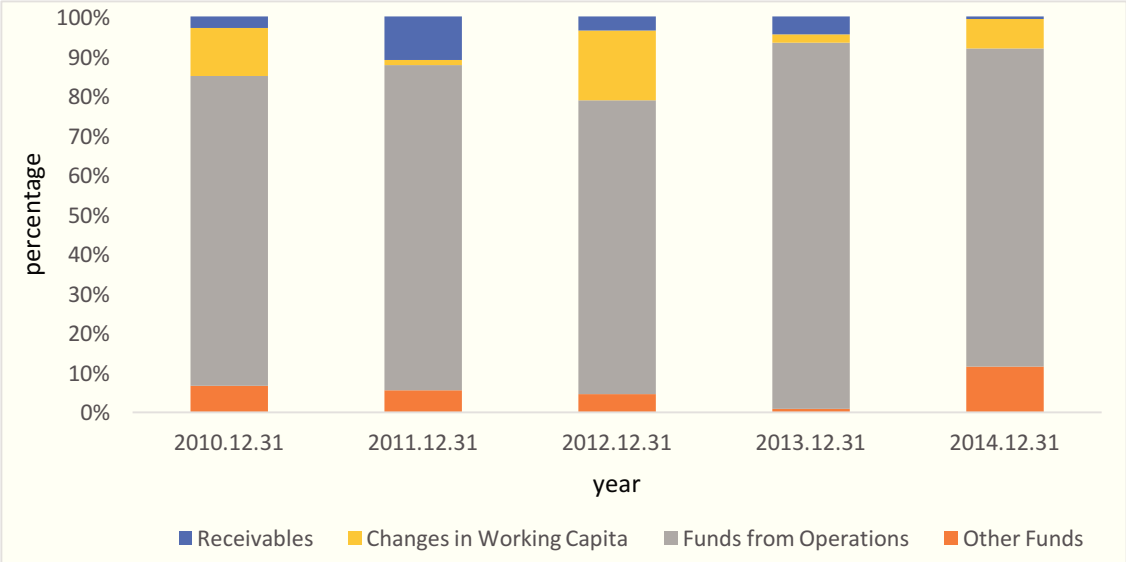


Chart 4.24 Structure of inflow in operating activity



It shows the proportions of each items in operating activity, depreciation, depletion & amortization is the biggest amount of outflow in operating activity, funds from operating is the biggest amount of inflow in operating activity. Account payable takes less than 50% in outflows of operating activity.

Chart 4.25 Structure of outflow in investing activity

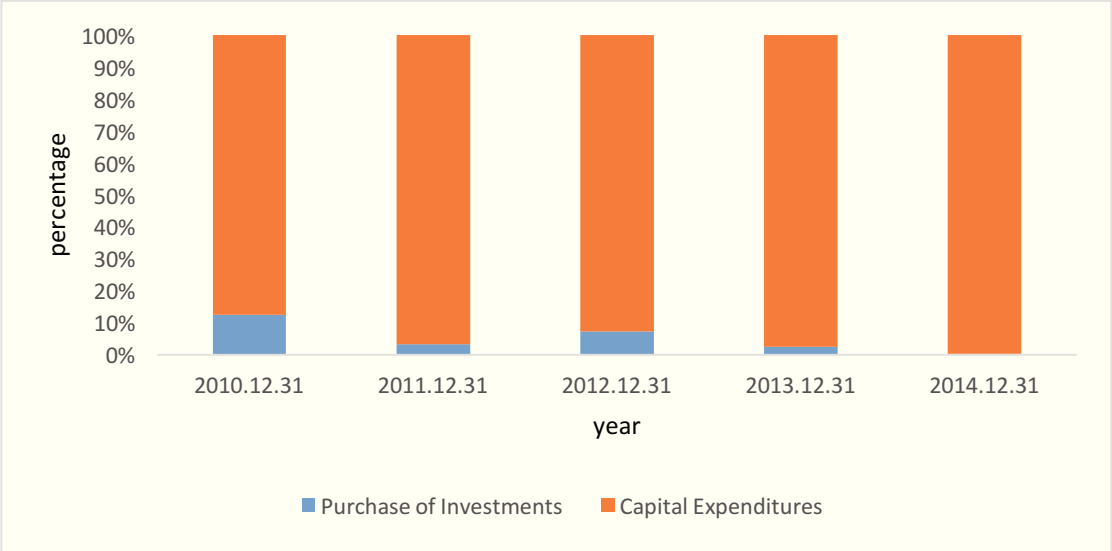
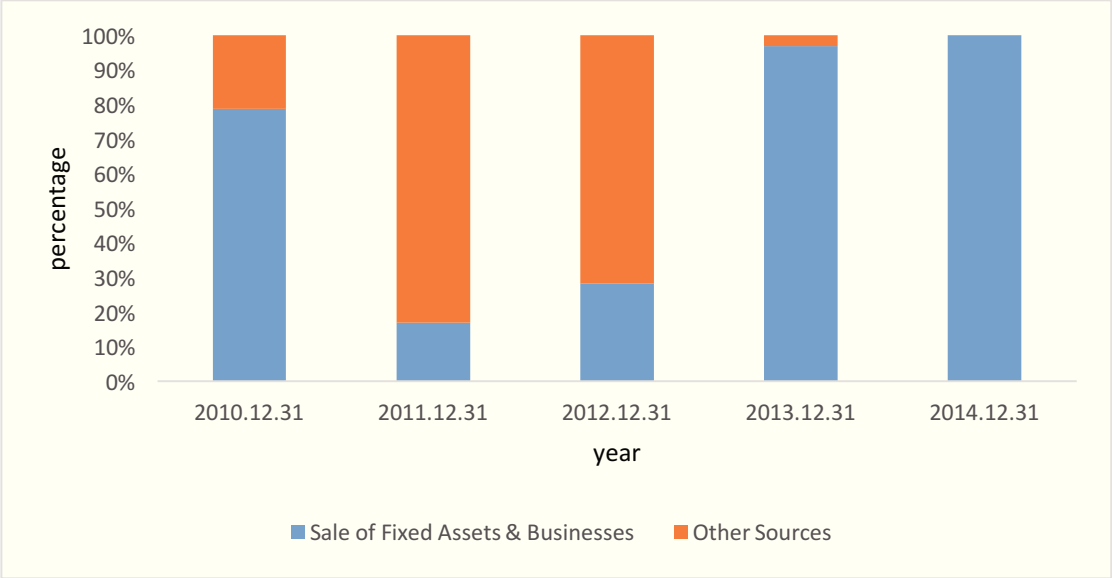


Chart 4.26 Structure of inflow investing activity



As is showed in the chart, most of outflow are spend on capital expenditures, it takes 90% of the proportion at least. The outflow on purchase of investments decrease year by year. About the income, the proportion of sale of fixed assets takes 80% at first, then decrease to 18% in 2012, after one year, it grows to 98% and keep growing. The proportion of other source in the income only take 20% at first, then increase to 80% in2012, but after that, it decreases year by year. There are only two items in the inflow of investing activity. In general, the cash flow come from the sales of goods and fixed assets.

Chart 4.27 Structure of outflow in financing activity

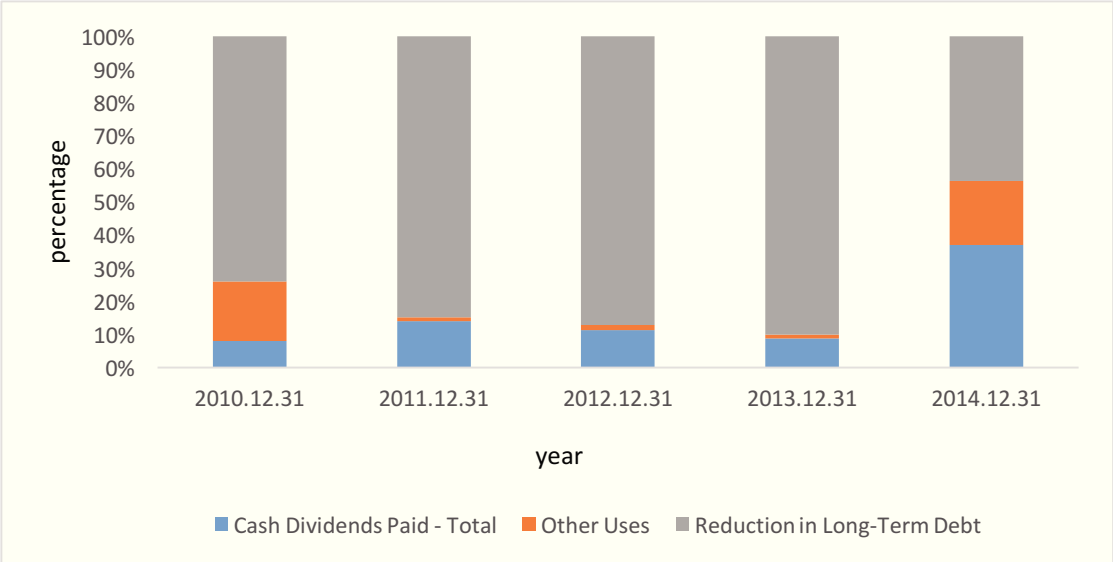
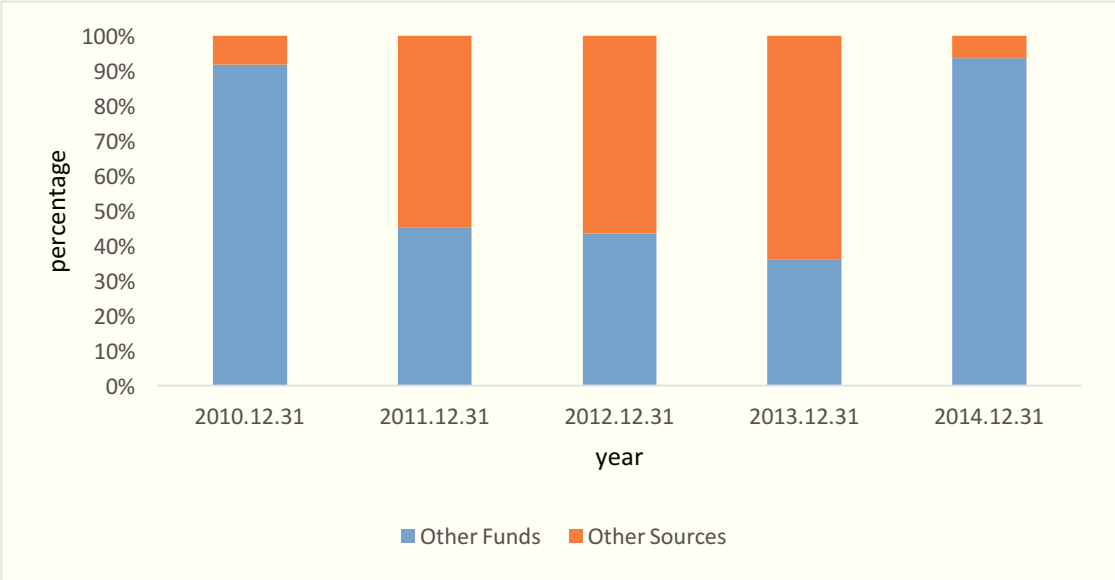


Chart 4.28 Structure of inflow in financing activity



It can be seen in the chart, the inflow of financing activity come from funds mostly, the inflow of funds has 90% at the beginning, decrease to 38% during 2011-2013, however, increase back to 93% in 2014. The biggest amount of out flow is reduction of long-term debt, the second is cash dividend paid.

4.2 Financial ratio analysis

Financial ratio analysis is a measure of compare financial data in the form of financial

ratio to assess the financial health of the company; which are calculated from financial data and market data. Financial ratios can be divided in five main parts, profitability ratios, liquidity ratios, solvency ratios, asset management ratios and market ratios.

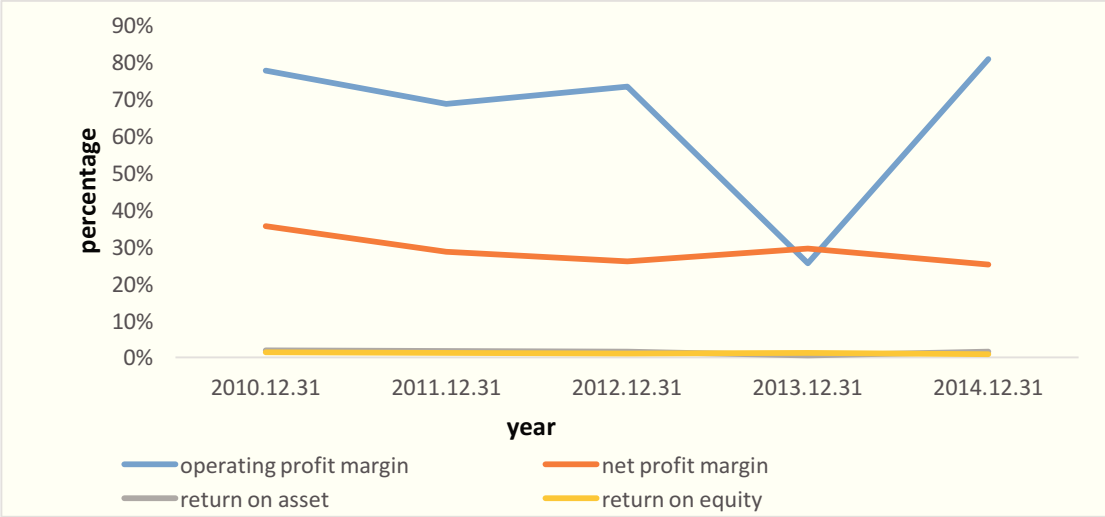
4.2.1 Profitability ratios

Financial ratio helps us understand the company's situation better. There are four basic ratios of profitable ratios: operating profit margin, net profit margin, return on assets, return on equity. We will analyze the company by these basic ratios.

Tab 4.1 Profitability ratios 2010-2014

	2010.12.31(%)	2011.12.31(%)	2012.12.31(%)	2013.12.31(%)	2014.12.31(%)
Operating profit margin	77.46	68.55	73.15	25.36	80.50
Net profit margin	35.48	28.51	25.92	29.37	25.07
Return on assets	1.79	1.62	1.48	0.47	1.43
Return on equity	1.34	1.19	0.96	1.11	0.82

Chart 4.29 Growth trend of profitability ratio 2010-2014



From tab and chart, we can observe that three of these four ratios only have a little change, net profit margin, return on asset, return on equity are stable over these five years. In the other side, operating profit margin changes more, it decreases a lot, reduce from 73.155% to 25.366% during 2012-2013, then it increases from 25.366% to 80.506% during 2013-2014.Net profit margin keeps around in 30%, return on

assets keep around in 1.5%, return on equity keeps around 1%. In general, three ratios decline during five years except operating profit margin. The operating profit margin measures operating profit per one unit of revenues. It means the earnings before interest and tax decrease a lot in 2013, in this year, the company does not manage its operation well.Net profit margin measures net profit per one unit of revenues. It decreases from35.480% to 25.922% during 2010-2012, and grow back to 29.379% in 2013. Return on assets measures net profit as a percentage for every unit of company assets. Return on equity measures firm's efficiency profits from every unit of shareholder's equity. These two ratios are very stable, the main reason of its decline is the earnings before interest and tax are less than other years in 2013.

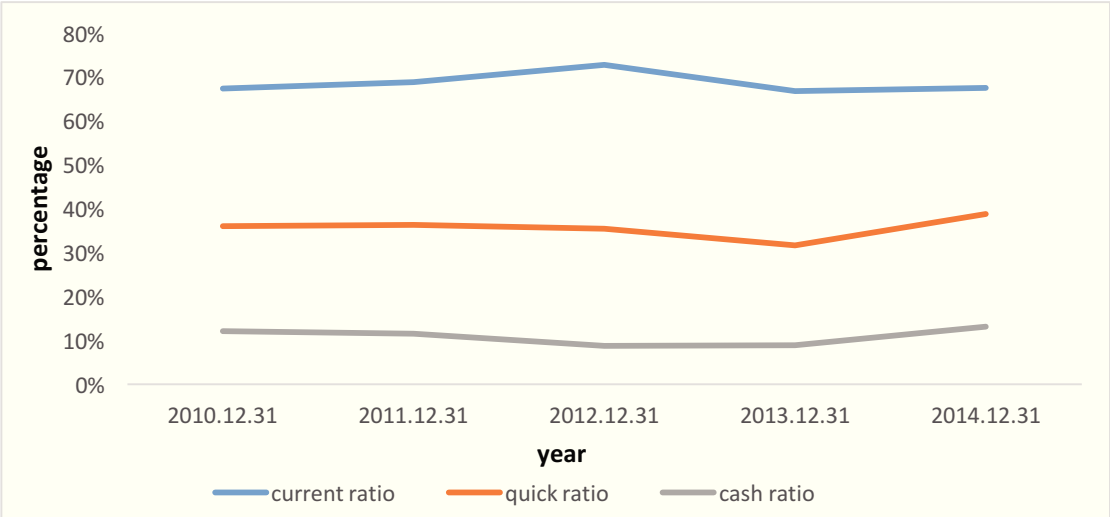
4.2.2 Liquidity ratios

Liquidity ratios measures company's ability to meets its immediate or short term liabilities and obligations. It analyzes company's liquid assets (in the form of cash or can be quickly converted in cash) and short term liabilities and obligations. Liquidity of company equals to its ability to have cash available when the company needs to meet its short term obligation. It can be divided in three basic ratios: current ratio, quick ratio cash ratio. We will use these three ratios to analyze Petro China Co. Ltd. The higher the ratios, indicating the company's assets liquidation is strong and the short term paying ability is strong.

Tab 4.2 Liquidity ratios 2010-2014

	2010.12.31(%)	2011.12.31(%)	2012.12.31(%)	2013.12.31(%)	2014.12.31(%)
Current ratio	67.45	68.82	72.73	66.76	67.48
Quick ratio	36.06	36.27	35.48	31.59	38.86
Cash ratio	12.14	11.48	8.69	8.86	13.11

Chart 4.30 Growth trend of liquidity ratio 2010-2014



Viewing Tab 4.2 and Chart 4.24. The obvious trend is that the liquidity ratios are stable during 2010-2012, and have slightly changes during 2012-2014.Current ratio measures amount of current assets for every unit in current liability, equals the current assets divided by the current liabilities. The current assets and current liability both increase during 2010-2012, so the current ratio increase from 67.454% to 72.735%. In 2013, the current assets decrease and the current liability increase, that is the reason the current ratio decrease a lot, and it remain stable during 2013-2014.Quick ratio is more stringent test of firm's liquidity.it is used to analysis company's ability to satisfy its short term obligations with its liquid assets. So it is more conservative than the current ratio. Quick ratio is stable during 2010-2012, decline in 2013 then grow from 31.594% to 38.862% during 2013-2014.Because of the inventories increase during 2012- 2013 and decreased a lot during 2013-2014 and current assets are adjusted for inventories due to the fact, the quick ratio changes. Cash ratio shows the ratio of cash in circulation and deposit. It is also used to measures company's ability to satisfy the current obligation with the cash and cash equivalents. At the same time, the cash ratio is the most conservative ratios in liquidity ratios. During 2010-2013, the cash ratio drops from12.149% to 8.869% and grow back to 13.110% in 2014.In the former analysis we know that the amount of cash decrease year by year during 2010-2013, indicating the ability of Petro China Co. Ltd with cash to repay short term obligation weakened. In 2014, the cash and market securities increase back as before, the cash

ratio increase to 13.110% in 2014, the ability of which is strong as it used to.

4.2.3 Solvency analysis

Just as the same with liquidity, the solvency is used to refer the company's financial health. It measures company's ability to meets its long term obligations, it is also called financial leverage ratios, used to assess a company's level of financial risk. The basic type of solvency ratios is debt ratio, debt to equity ratio, interest coverage.

Tab 4.3 Solvency ratios2010-2014

	2010.12.31	2011.12.31	2012.12.31	2013.12.31	2014.12.31
Debt ratio(%)	3.91	43.46	45.55	45.66	45.18
Debt-to-equity ratio(%)	6.40	76.86	83.67	93.19	83.43
Interest coverage	48.28	29.37	17.91	4.62	14.24

Chart 4.31 Growth trend of Solvency ratio 2010-2014

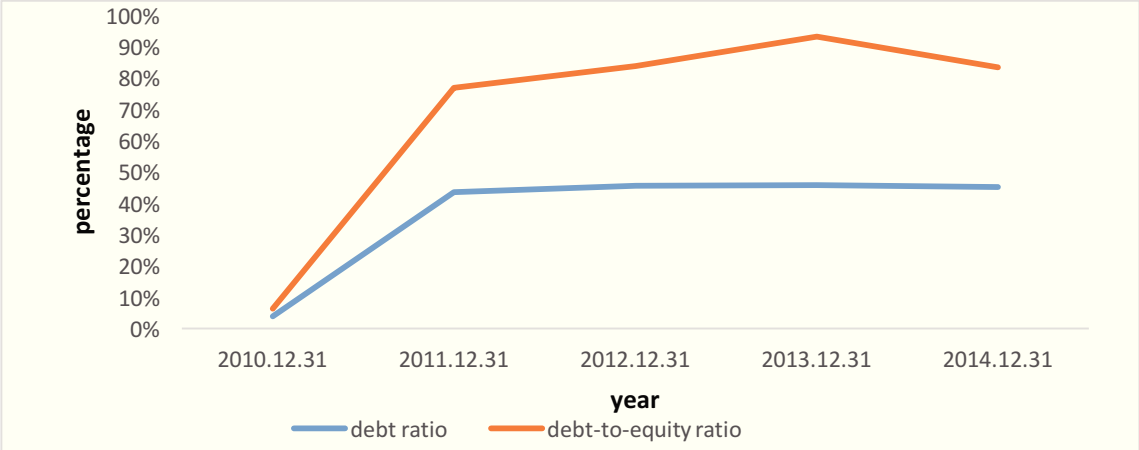
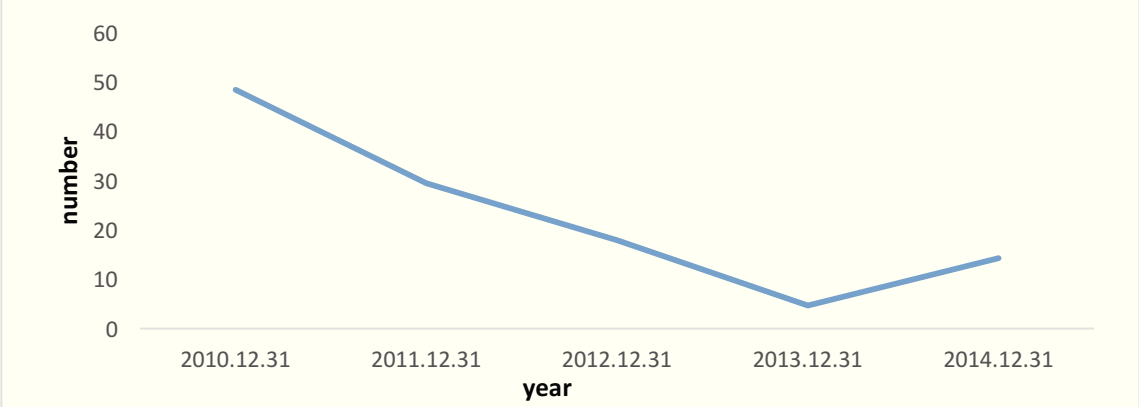


Chart 4.32 Growth trend of Interest coverage 2010-2014



Total liabilities divided by the proportion of an enterprise's total assets obtained. This ratio can display percentages and leverage assets by the process of loan financing obtained, may also explain the situation to the creditor protection. Liabilities creditor claims on assets, when the amount of creditor claims on assets greater after the liquidation of all the less likely to recover the loans. Moreover, the proportion of larger enterprises represent assets mostly from debt, then the financial results of enterprises more inadequate. More debt, interest costs are much more detrimental to creditors. Creditors wished debt ratio the smaller the better.

At first, the debt ratio is very small, increase from 3.910% to 43.460% during 2010-2011, and keeps around 45% from 2011 to 2014.In 2010, the total liability is very small, which lead to a good situation. Debt to Equity Ratio is a debt ratio used to measure a company's financial leverage, calculated by dividing a company's total liabilities by stockholders' equity. The debt to equity ratio represents how much debt a company is using to finance its assets relative to the amount of value showed in shareholders' equity. This ratio increase from 6.407% to 93.197% during 2010-2013, decreased to 83.436% during 2013-2014.However, all of them are smaller than one, the company uses less debt for assets financing than equity. Interest coverage is known as interest cover; it is a measure to tell whether the company's operating profit is able to meet current interest payments.

Interest coverage is basically a risk warning indicator, particularly after the low performance in the company, free cash flow is more critical vulnerable period, it may indicate whether the company also has the ability to pay interest on debt in order to avoid risks, and whether there is financing the ability to reverse the predicament. Obviously, this ratio is less than 1 the Company has been very critical, indicating profits generated by the company are not enough even to pay the bank interest. In fact, when the ratio is less than 1.5, it is necessary to attract investors wary. The indicators of interest can finance expense detail in the notes to the financial statements found in. It is oblivious that Petro China Co. Ltd is more than able to finance the interest. That means our company is well function, so the investors will be delightful.

4.2.4 Asset management ratios

Asset management ratios, so called asset activity ratios. It measures how well a company uses its assets such as assets utilization, and indicates how much a company invested in a particular assets relative to the revenues that the assets are generating. Moreover, assets efficiency utilization has a direct impact on liquidity. The basic types of activity ratios are: average collection period, accounts receivable, inventory turnover, total assets turnover.

Tab 4.4 Asset management ratios2010-2014

	2010.12.31	2011.12.31	2012.12.31	2013.12.31	2014.12.31
Average collection period	53.29	59.37	72.55	79.69	69.44
Account receivable turnover	6.75	6.06	4.96	4.51	5.18
Inventory turnover	62.79	69.81	69.07	67.40	95.43
Total assets turnover	2.32%	2.37%	2.02%	1.85%	1.78%

Chart 4.33 Growth trend of Average collection period 2010-2014

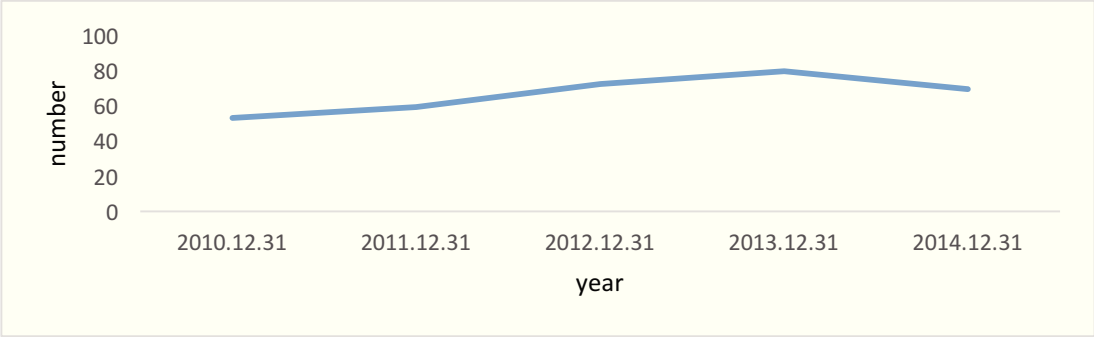


Chart 4.34 Growth trend of account receivable turnover 2010-2014

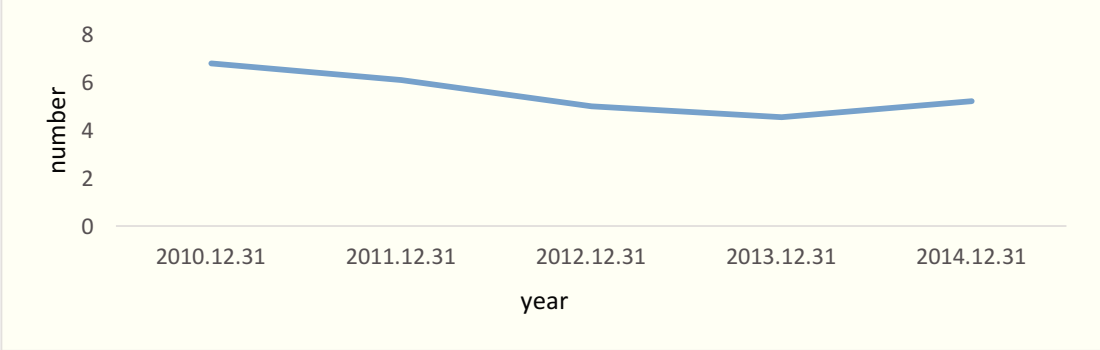
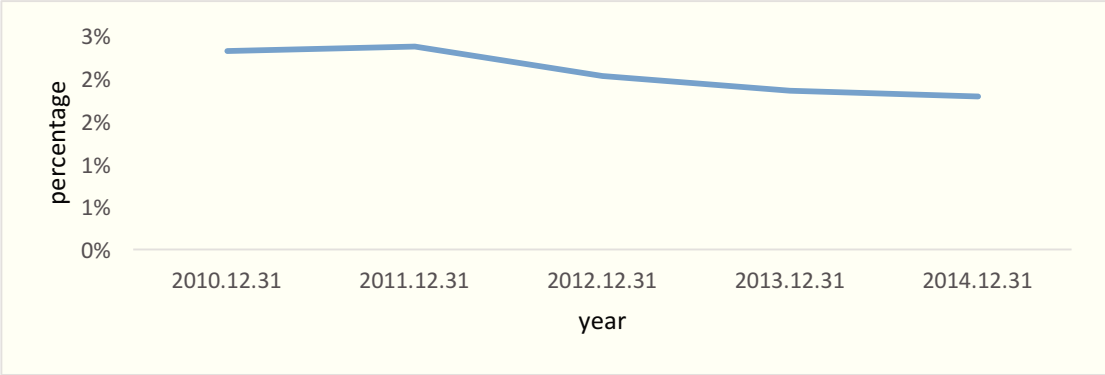


Chart 4.35 Growth trend of inventory turnover 2010-2014

Chart 4.36 Growth trend of total assets turnover 2010-2014



Average collection period also known as accounts receivable collection period, or the ratio of accounts receivable and refers to the average daily sales ratio, reflecting how long it takes to converse the account receivable into cash. Viewing the Chart and Tab, it takes longer and longer for conversion of account receivable into cash during 2010-2013, it grows from 53.29 days to 79.69 days, which means the company's liquidity decline. During 2013-2014, the situation become better, but still need 69.44 days. Account receivable turnover is an accounting measure that used to quantify a firm's effectiveness in extending credit and in collecting debts on that credit. The receivables turnover ratio measures how efficiently a firm uses its assets. Account receivable turnover ratio can be calculated by dividing the value of credit sales during a given period by the average accounts receivable during the same period. In the Tab, we can see the average times the account receivable is rolled over during a year is 5 times. During 2010-2013, it declines a little, and grow back at 2014, which means account receivable turnover is very stable. Inventory turnover is a measure of the

number of times inventory is sold or used in a time period such as a year. The more time the cycle is done during a year; the better position is it for the company. During 2010-2013, the inventory turnover keeps around 68, after a year, the inventory turnover increase to 95, which means the company runs better than former years. The total asset turnover ratio measures the ability of a company to use its assets to efficiently generate sales. It is an efficiency ratio which tells how successfully the company is using its assets to generate revenue. This ratio considers all assets, current and fixed. As is showed in the Tab and Chart, the total assets turnover keeps around 2%. In average, each unit invested in assets generates revenue of 2%. From2011-2014, the total assets turnover decrease, which mean the firm's sales are slugger than before.

4.3 Decomposition of ROE

When use the ratio analysis, sometimes we will neglect some details. Pyramidal decomposition enables to analyze what drives the value of financial ratios, such as which factors have impact on its value or evolution. In order of DuPont analysis, we break ROE ratio into three component ratios which are net profit margin, assets turnover and financial leverage. These three component ratios can indicate company operation too. Profit margin measures to show company's ability to generate profit and control cost. Assets turnover tells how successfully the company is using its assets to generate revenue. Financial leverage shows how much the company relying on debt.

Tab4.5 Details of decomposition 2010-2014

	2010.12.31	2011.12.31	2012.12.31	2013.12.31	2014.12.31
EAT/REV	0.35	0.29	0.26	0.29	0.25
REV/ASSETS	0.02	0.02	0.02	0.02	0.02
ASSETS/EQUITY	1.64	1.77	1.84	2.04	1.85
Return on equity	1.35%	1.20%	0.96%	1.11%	0.82%

Influence quantification can analyze indicators which changes have caused change in the basic ratio. In the same time, quantify which component ratios contributed to the

change in basic ratio at most. There are four methods for quantification of influence: methods of gradual changes, integral method, logarithmic decomposition method, functional decomposition method.

Tab 4.6 Methods of gradual change during 2010-2011

Gradual					
	2010	2011	Δa	ΔROE (%)	ORDER
EAT/REV	0.355	0.285	-0.070	-0.265	1
REV/ASSETS	0.023	0.024	0.0005	0.023	3
ASSETS/EQUITY	1.639	1.769	0.130	0.088	2
SUM				-0.154	

Tab 4.7 Logarithmic decomposition method during 2010-2011

Logarithmic					
	2010	2011	Index	ΔROE(%)	ORDER
EAT/REV	0.355	0.285	0.804	-0.278	1
REV/ASSETS	0.023	0.024	1.021	0.027	3
ASSETS/EQUITY	1.639	1.769	1.079	0.097	2
SUM				-0.154	

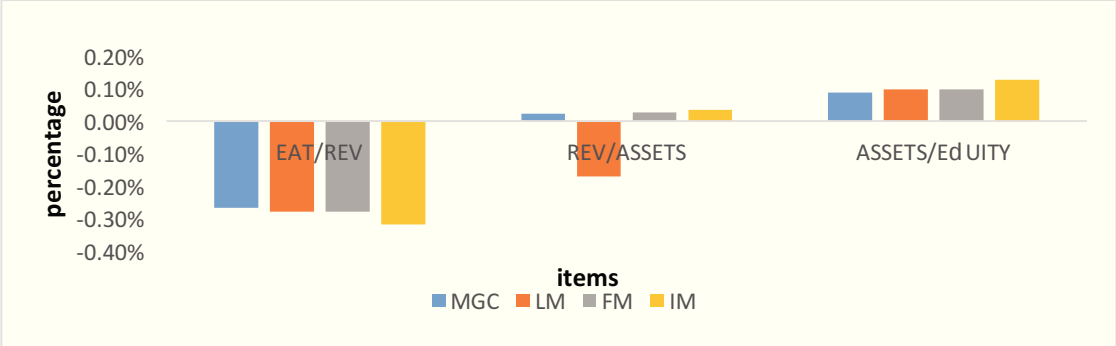
Tab 4.8 Functional decomposition method during 2010-2011

Functional					
	2010	2011	R	ΔROE(%)	ORDER
EAT/REV	0.355	0.285	-0.196	-0.279	1
REV/ASSETS	0.023	0.024	0.021	0.027	3
ASSETS/EQUITY	1.639	1.769	0.079	0.098	2
				-0.154	

Tab 4.9 Integral method during 2010-2011

integral					
	2010	2011	R	ΔROE(%)	ORDER
EAT/REV	0.355	0.285	-0.196	-0.316	1
REV/ASSETS	0.023	0.024	0.021	0.034	3
ASSETS/EQUITY	1.639	1.769	0.079	0.128	2
			-0.096	-0.154	

Chart 4.37 Four methods during 2010-2011



As it seen from Tab4.5, the ROE decrease during fiscal 2010 to 2011 from 1.35% to 1.20%, profit margin decrease from 0.355 to 0.285, assets turnover increase 0.001, financial leverage increase from 1.639 to 1. 769.From Tab 4.6-4.9, we can see absolute change in the basic ratio caused by the change in the component ratio. In method of gradual changes, the profit margin decrease cause ROE decrease 0.265%, the change of assets turnover causes ROE increase 0.023%,financial leverage increase causes ROE increase 0.087%.Use logarithmic decomposition method, the change of profit margin causes ROE decrease around 0.28%,the change of assets turnover causes ROE increase around 0.027%,the change of financial leverage causes ROE increase round 0.097%.Now,we look at the functional decomposition method .Because of the difference in profit margin, ROE decrease around 0.279%.The difference of assets turnover causes ROE increase around 0.027%.The difference of financial leverage causes ROE increase around 0.098%.About integral method, profit margin decrease from 0.355 to 0.285 causes ROE decrease around 0.316%,assets turnover increase 0.001 causes ROE increase 0.034%,financial leverage increase from 1.639 to 1.769 causes ROE increase 0.127%.As is showed in the Chart 4.27,when the profit margin (EAT/Rev) changes, the difference of return on equity between fiscal 2010 to 2011 is more obvious than assets turnover and financial leverage. Comparing the changes of ROE when assets turnover (Rev/Asset) and financial leverage (Asset/Equity) increase, it is clear that financial leverage has more influence. Through the result, we presume profit margin contributed to the change in basic ratio most, the second influence is financial leverage, assets turnover has minimal impact on return of equity. This is the analysis of fiscal 2010 to 2011.

Tab 4.10 Methods of gradual change during 2011-2012

Gradual					
	2011	2012	Δa	ΔROE(%)	ORDER
EAT/REV	0.285	0.259	-0.026	-0.109	2
REV/ASSETS	0.024	0.020	-0.003	-0.158	1
ASSETS/EQUITY	1.769	1.837	0.068	0.036	3
SUM				-0.231	

Tab 4.11 Logarithmic decomposition method during 2011-2012

Logarithmic					
	2011	2012	Index	ΔROE(%)	ORDER
EAT/REV	0.285	0.259	0.909	-0.102	2
REV/ASSETS	0.024	0.020	0.855	-0.169	1
ASSETS/EQUITY	1.769	1.837	1.038	0.041	3
SUM				-0.231	

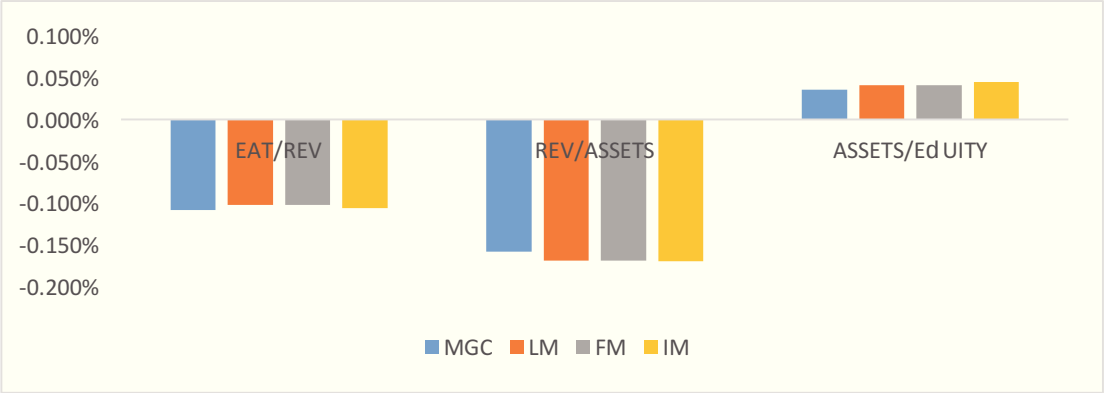
Tab 4.12 Functional decomposition method during 2011-2012

Functional					
	2011	2012	R	ΔROE(%)	ORDER
EAT/REV	0.285	0.259	-0.091	-0.103	2
REV/ASSETS	0.024	0.020	-0.145	-0.169	1
ASSETS/EQUITY	1.769	1.837	0.038	0.041	3
				-0.231	

Tab 4.13 Integral method during 2011-2012

Integral method					
	2011	2012	R	ΔROE(%)	ORDER
EAT/REV	0.285	0.259	-0.091	-0.106	2
REV/ASSETS	0.024	0.020	-0.145	-0.170	1
ASSETS/EQUITY	1.769	1.837	0.038	0.045	3
			-0.198	-0.231	

Chart 4.38 Four methods during 2011-2012



As it seen from Tab4.5, the ROE decrease during fiscal 2011 to 2012 from 1.20% to 0.964%, profit margin decrease from 0.285 to 0.259, assets turnover decrease from0.023 to 0.020, financial leverage increase around 0.1. Tab 4.10-4.13, we can see absolute change in the basic ratio caused by the change in the component ratio. In method of gradual changes, the change of profit margin causes ROE decrease around 0.108%,the change of assets turnover causes ROE decrease around 0.158%,the change of financial leverage causes ROE increase round 0.036%.Use logarithmic

decomposition method, the profit margin decrease cause ROE decrease 0.102%, the change of assets turnover causes ROE decrease 0.168%, financial leverage increase causes ROE increase 0.040%.About functional decomposition method .Because of the difference in profit margin, ROE decrease around 0.103%.The difference of assets turnover causes ROE decrease around 0.169%.The difference of financial leverage causes ROE increase around 0.041%.The last one, Integral method, profit margin decrease from 0.285 to 0.259 causes ROE decrease 0.105%,assets turnover decrease from0.023 to 0.020 causes ROE decrease 0.169%,financial leverage increase around 0.1 causes ROE increase 0.044%.Now,from the Chart 4.28,we can see when the asset turnover (Rev/Asset) change, the ROE change most. The conclusion is the asset turnover has the greatest impact on return on equity, which follows profit margin, financial leverage is less important.

Tab 4.14 Methods of gradual change during 2012-2013

Gradual					
	2012	2013	Δa	ΔROE(%)	ORDER
EAT/REV	0.259	0.294	0.035	0.129	1
REV/ASSETS	0.020	0.019	-0.002	-0.092	3
ASSETS/EQUITY	1.837	2.041	0.204	0.111	2
SUM				0.148	

Tab 4.15 Logarithmic decomposition method during 2012-2013

Logarithmic					
	2012	2013	Index	ΔROE(%)	ORDER
EAT/REV	0.259	0.294	1.133	0.130	1
REV/ASSETS	0.020	0.019	0.916	-0.091	3
ASSETS/EQUITY	1.837	2.041	1.111	0.109	2
SUM				0.148	

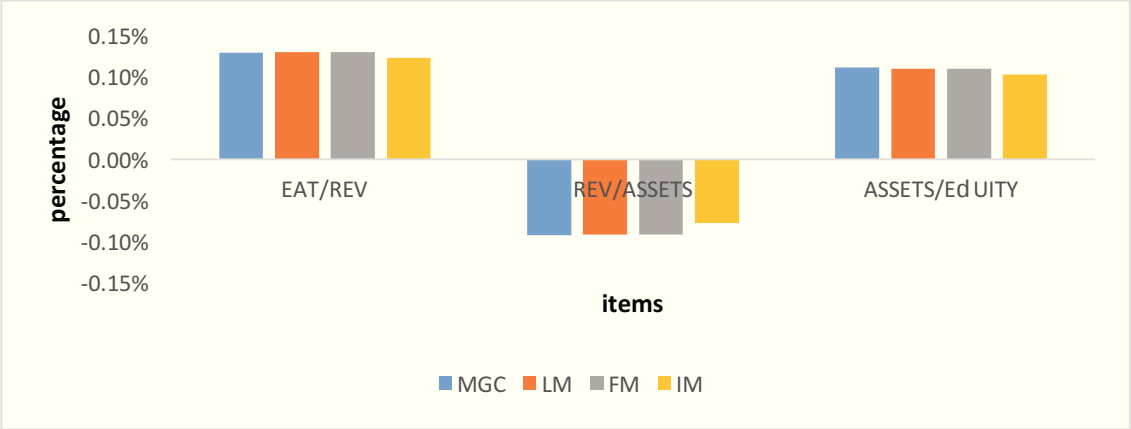
Tab 4.16 Functional decomposition method during 2012-2013

Functional					
	2012	2013	R	ΔROE(%)	ORDER
EAT/REV	0.259	0.294	0.133	0.130	1
REV/ASSETS	0.020	0.019	-0.084	-0.092	3
ASSETS/EQUITY	1.837	2.041	0.111	0.109	2
				0.148	

Tab 4.17 Integral method during 2012-2013

Integral method					
	2012	2013	R	ΔROE(%)	ORDER
EAT/REV	0.259	0.294	0.133	0.123	1
REV/ASSETS	0.020	0.019	-0.084	-0.072	3
ASSETS/EQUITY	1.837	2.041	0.111	0.102	2
			0.160	0.148	

Chart 4.39 Four methods during 2012-2013



As is showed from Tab4.5, the ROE increase during fiscal 2012 to 2013 from0.964% to 1.112%,profit margin increase from 0.259 to 0.293,assets turnover decrease from 0.020 to 0.018,financial leverage increase from 1.836 to 2.040.In Tab 4.14-4.17 ,we can see in method of gradual changes, the profit margin increase cause ROE increase0.128%, the change of assets turnover causes ROE decrease 0.092%,financial leverage increase causes ROE increase 0.111%.From logarithmic decomposition method, the change of profit margin causes ROE increase around 0.129%the change of assets turnover causes ROE decrease around 0.091%,the change of financial leverage causes ROE increase round 0.109%.We look at the functional decomposition method .Because of the difference in profit margin, ROE increase around 0.129%.The difference of assets turnover causes ROE decrease around 0.091%.The difference of financial leverage causes ROE increase around 0.109%.About integral method, profit margin increase from 0.259 to 0.293 causes ROE increase around 0.122%,assets turnover decrease from 0.02 to 0.018 causes ROE decrease 0.077%, financial leverage increase from 1.836 to 2.040 causes ROE increase 0.102%.As is showed in the Chart 4.29,when the profit margin (EAT/Rev) changes, the difference of return on equity

between fiscal 2012 to 2013 is more obvious than assets turnover and financial leverage. Comparing the changes of ROE when assets turnover (Rev/Asset) and financial leverage (Asset/Equity) change, it is clear that financial leverage has more influence. Through the result, we are sure profit margin contributed to the change in basic ratio most, the second influence is assets turnover, financial leverage has minimal impact on return of equity.

Tab 4.18 Methods of gradual change during 2013-2014

Gradual					
	2013	2014	Δa	ΔROE(%)	ORDER
EAT/REV	0.294	0.251	-0.043	-0.163	1
REV/ASSETS	0.019	0.018	-0.001	-0.035	3
ASSETS/EQUITY	2.041	1.847	-0.194	-0.087	2
SUM				-0.285	

Tab 4.19 Logarithmic decomposition method during 2013-2014

Logarithmic					
	2013	2014	Index	ΔROE(%)	ORDER
EAT/REV	0.294	0.251	0.853	-0.153	1
REV/ASSETS	0.019	0.018	0.964	-0.036	3
ASSETS/EQUITY	2.041	1.847	0.905	-0.096	2
SUM				-0.285	

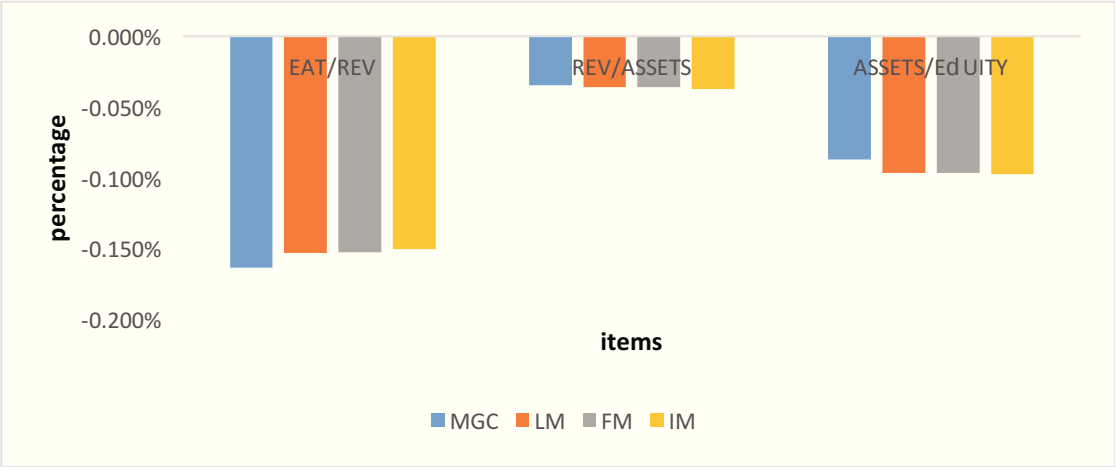
Tab 4.20 Functional decomposition method during 2013-2014

Functional					
	2013	2014	R	ΔROE(%)	ORDER
EAT/REV	0.294	0.251	-0.147	-0.152	1
REV/ASSETS	0.019	0.018	-0.036	-0.036	3
ASSETS/EQUITY	2.041	1.847	-0.095	-0.096	2
				-0.285	

Tab 4.21 Integral method during 2013-2014

Integral method					
	2013	2014	R	ΔROE(%)	ORDER
EAT/REV	0.294	0.251	-0.147	-0.150	1
REV/ASSETS	0.019	0.018	-0.036	-0.037	3
ASSETS/EQUITY	2.041	1.847	-0.095	-0.097	2
SUM				-0.285	

Chart 4.40 Four methods during 2013-2014



We can see from Tab4.5, the ROE decrease during fiscal 2013 to 2014 from 1.112% to 0.827%, profit margin decrease from 0.293 to 0.251, assets turnover decrease around 0.001, financial leverage decrease from 2.041 to 1. 846.Tab 4.7, it can be seen the change of profit margin causes ROE decrease around 0.163%, the change of assets turnover causes ROE decrease around 0.034%, the change of financial leverage causes ROE decrease round 0.087%. About logarithmic decomposition method, the profit margin decrease cause ROE decrease 0.152%, the change of assets turnover causes ROE decrease 0.035%, financial leverage decrease causes ROE decrease 0.096%. In functional decomposition method. Because of the difference in profit margin, ROE decrease around 0.152%. The difference of assets turnover causes ROE decrease around 0.035% The difference of financial leverage causes ROE increase around 0.096%. And integral method, profit margin decrease causes ROE decrease 0.149%, assets turnover decrease causes ROE decrease 0.037%, financial leverage decrease causes ROE decrease 0.097%. Viewing the Chart 4.28, we can see when the profit margin (EAT/Rev) change, the ROE change most. The conclusion is the profit margin (EAT/Rev) has the greatest impact on return on equity, which follows financial leverage, asset turnover is less important. So, when we make decisions about how to make return on equity change, we need to focus on the profit margin, we can make changes in earning after tax or revenues.

4.4 Sensitivity analysis

A sensitivity analysis is a technique that used to determine how different values of an independent variable will impact a particular dependent variable under a given set of assumptions. In our case, we will analyze how different values of earning after tax, revenue, equity, asset will impact the ROE decomposition. We still use these four methods: methods of gradual changes, integral method, logarithmic decomposition method, functional decomposition method.

Chart 4.41 Impact of change in EAT on influence of component ratios in MGCH

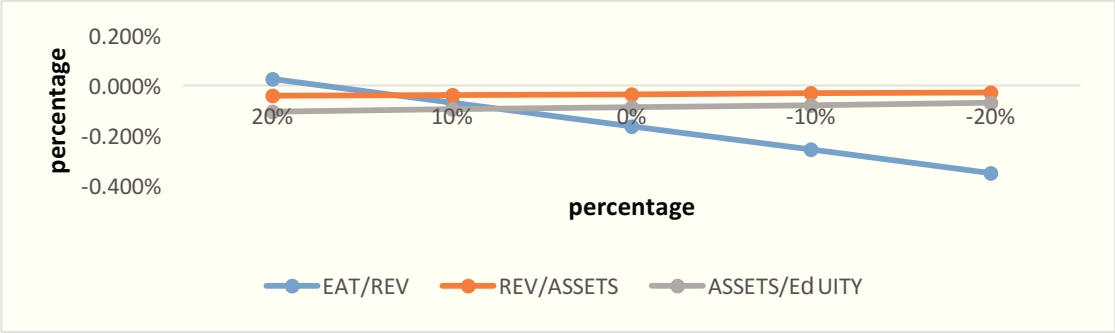


Chart 4.42 Impact of change in Revenues on influence of component ratios in MGCH

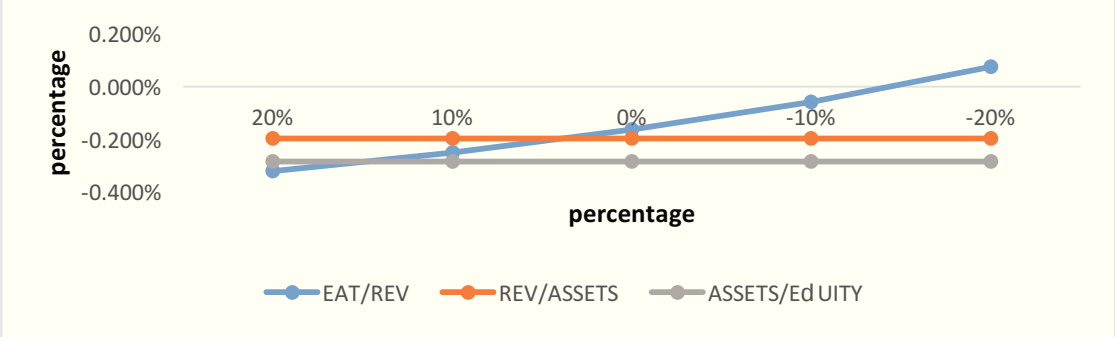


Chart 4.43 Impact of change in Equity on influence of component ratios in MGCH

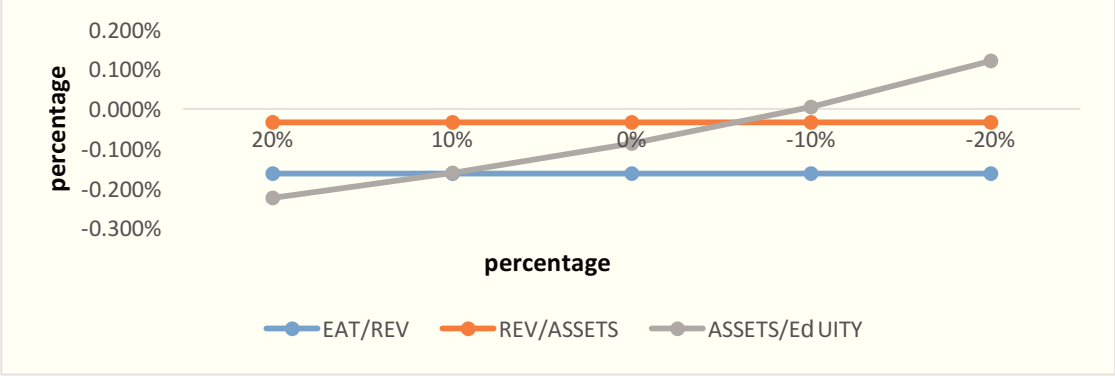
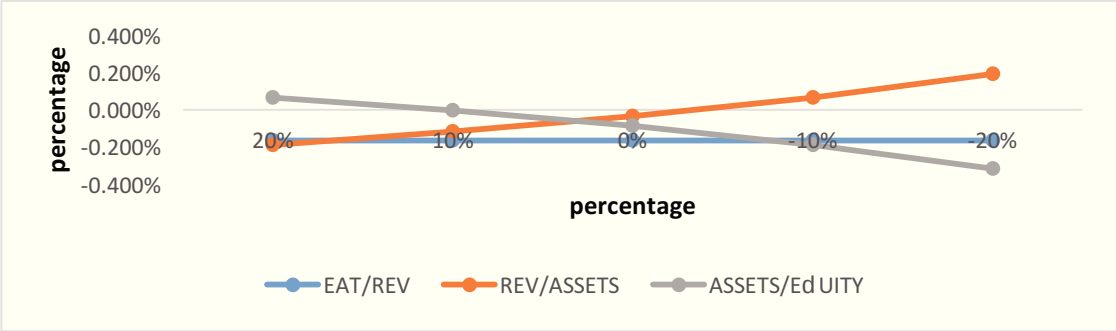


Chart 4.44 Impact of change in Assets on influence of component ratios in MGCH



Viewing chart 4.11-4.44, first let us look at the EAT change. When earning after tax decrease profit margin decrease, asset turnover and financial leverage increase. Profit margin is more sensitive to the change of earning after tax, it has greater amplitude decreases. Financial leverage and assets turnover only increase a little. When revenue decline, financial leverage remains the same, profit margin increase, asset turnover decrease slightly. It's clear that revenue affects more on profit margin. At the time equity decrease, profit margin and asset turnover have no change, financial leverage increase. When assets decline, profit margin stays same, asset turnover increase, financial leverage decrease. According to the magnitude of the line of view, asset turnover is more sensitive to the change of asset.

Chart 4.45 Impact of change in EAT on influence of component ratios in LM

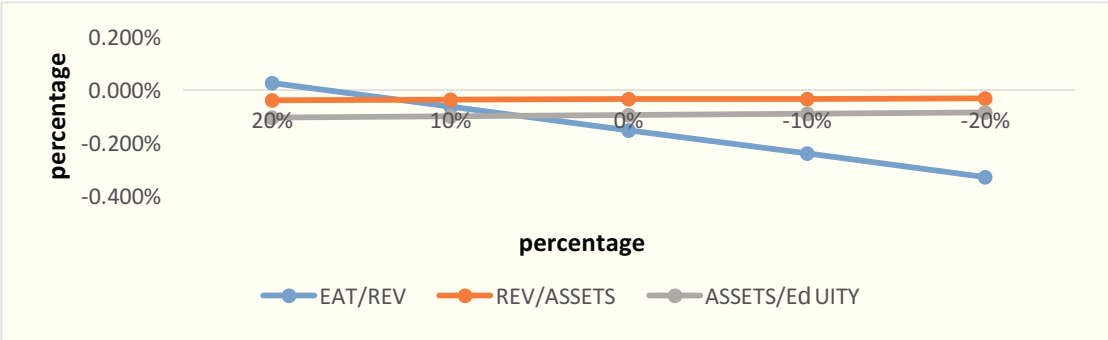


Chart 4.46 Impact of change in Revenues on influence of component ratios in LM

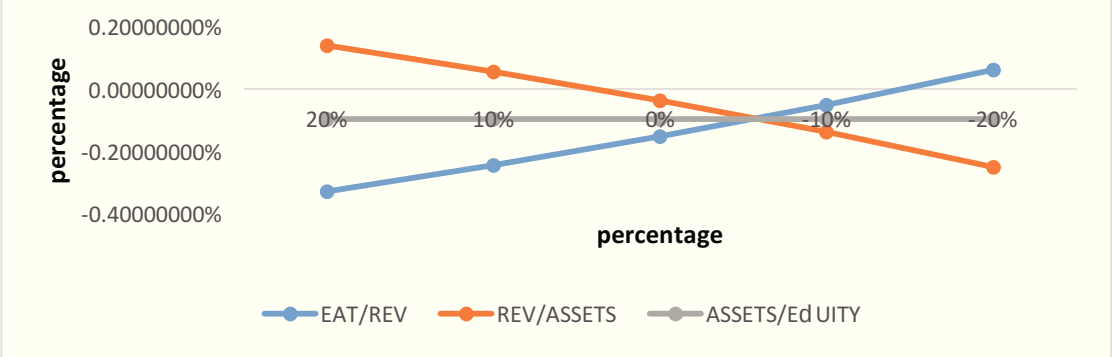


Chart 4.47 Impact of change in Equity on influence of component ratios in LM

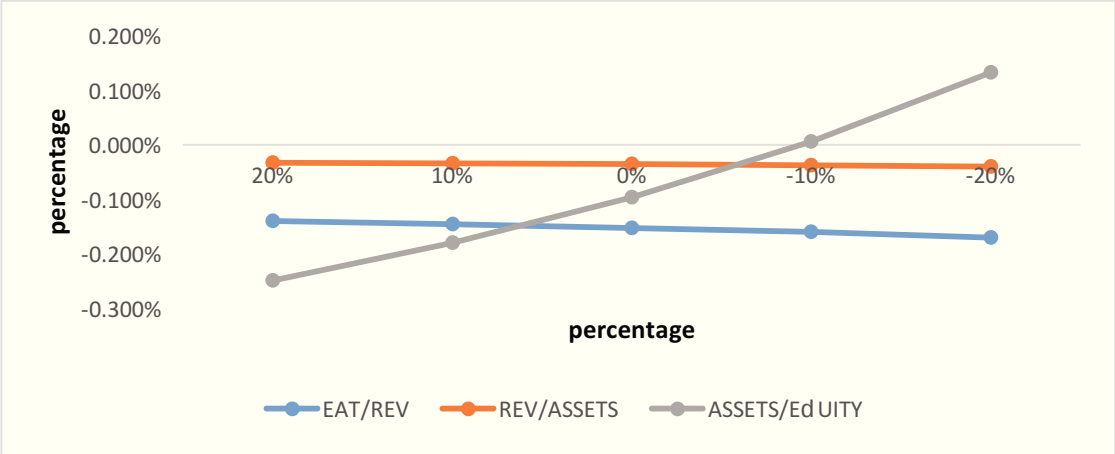
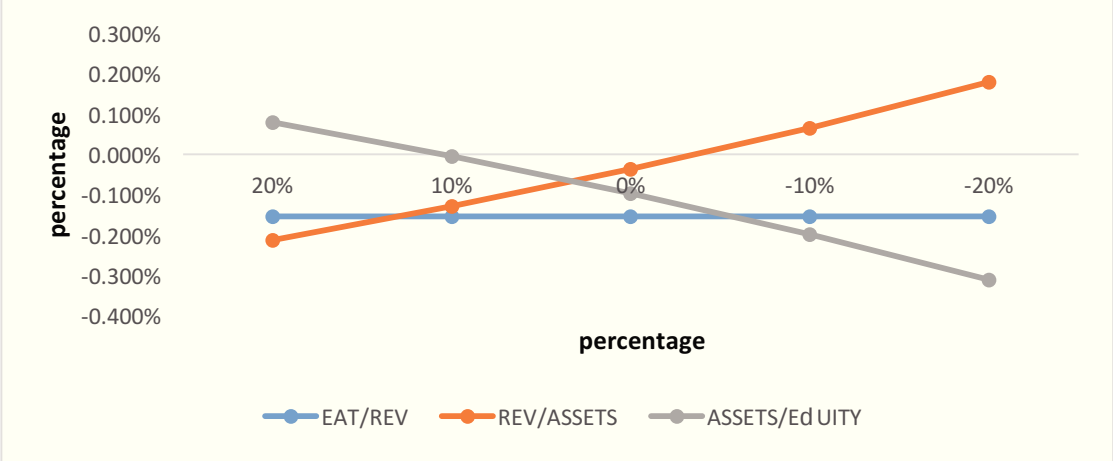


Chart 4.48 Impact of change in Assets on influence of component ratios in LM



As it can be seen in the chart 4.45-4.48 when earning after tax decrease, profit margin decreases a lot, in the same time, asset turnover and financial leverage have small growing which is hardly to be seen. It means profit margin is more sensitive to the earnings after tax. Then, we focus on the change of revenue, the decrease of revenue causes profit margin increase and asset turnover decrease a lot, but financial leverage stays the same. From the change of equity, profit margin and asset turnover, both of them are decline a little bit, and financial leverage increase. It presents that financial leverage is more sensitive to the changes of equity. About assets change, profit margin does not change, asset turnover increase and financial leverage decrease because of the assets decrease. Assets turnover is affected more.

Chart 4.49 Impact of change in EAT on influence of component ratios in FM

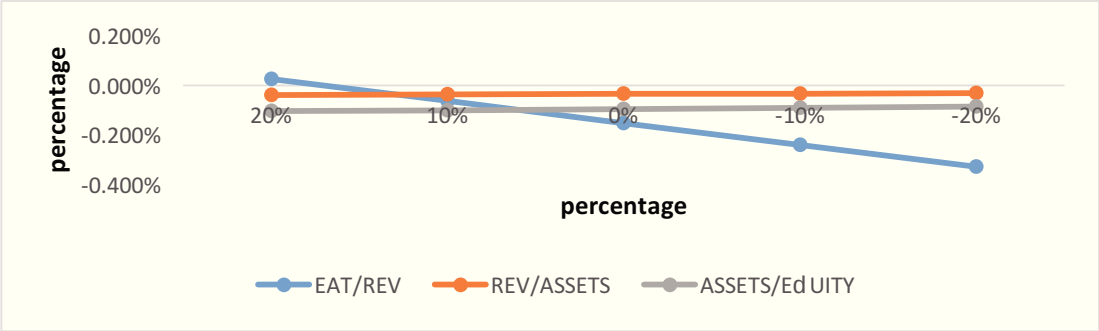


Chart 4.50 Impact of change in Revenues on influence of component ratios in FM

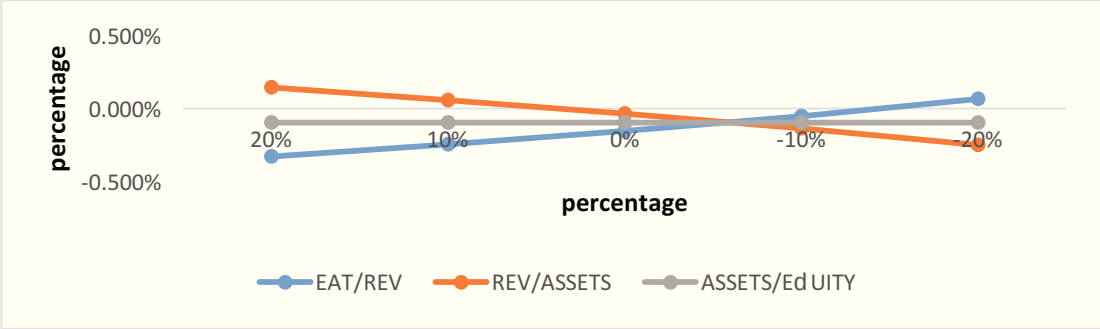


Chart 4.51 Impact of change in Equity on influence of component ratios in FM

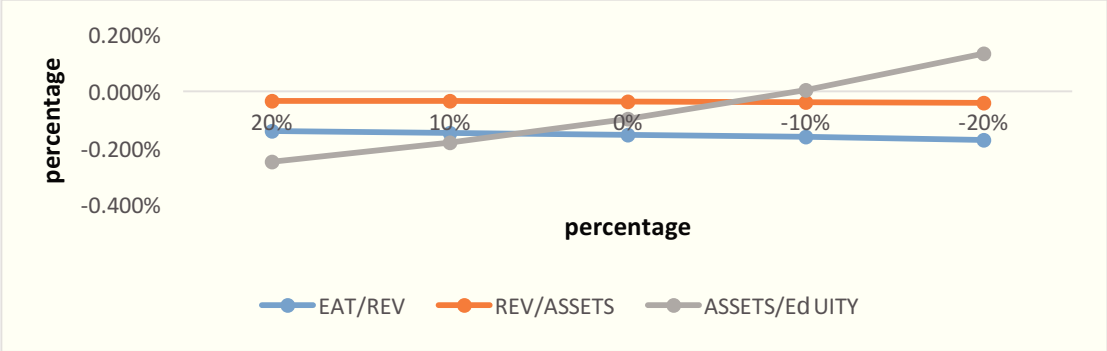
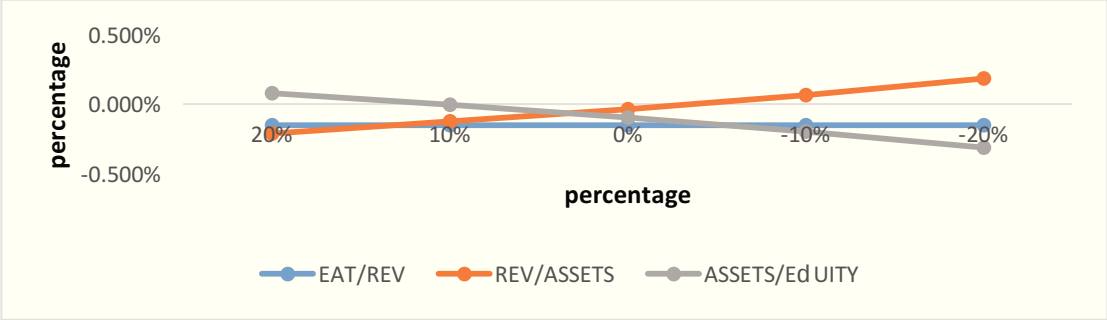


Chart 4.52 Impact of change in Assets on influence of component ratios in FM



Though chart 4.49-4.52 we can see that when earning after tax decrease profit margin decrease, asset turnover and financial leverage increase. Profit margin is more sensitive to the change of earning after tax. Financial leverage and assets turnover only increase a little. When revenue decline, financial leverage is almost the same,

profit margin increase, asset turnover decrease. It's oblivious that revenue affects more on profit margin. When equity decrease, profit margin and asset turnover decrease, financial leverage increase. Financial leverage is more sensitive to the equity. When assets decline, profit margin stays same, asset turnover increase, financial leverage decrease. According to the magnitude of the line of view, asset turnover is more sensitive to the change of asset.

Chart 4.53 Impact of change in EAT on influence of component ratios in IM

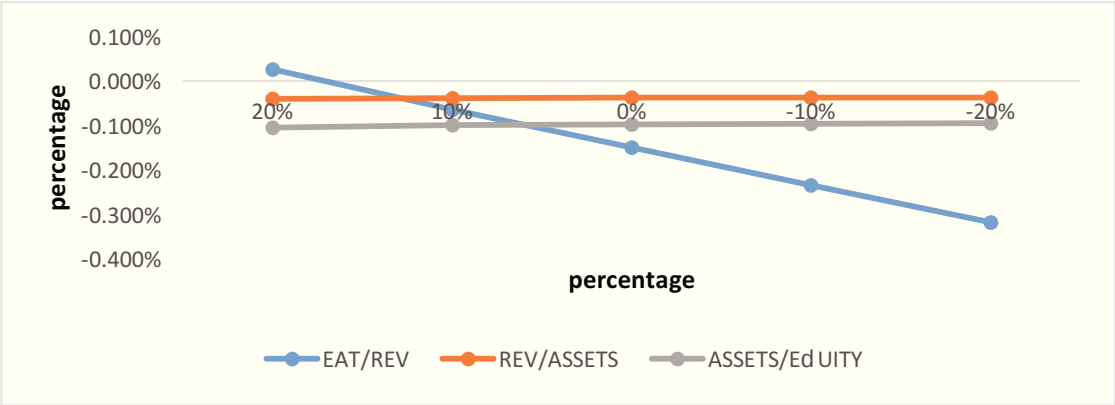


Chart 4.53 Impact of change in Revenues on influence of component ratios in IM

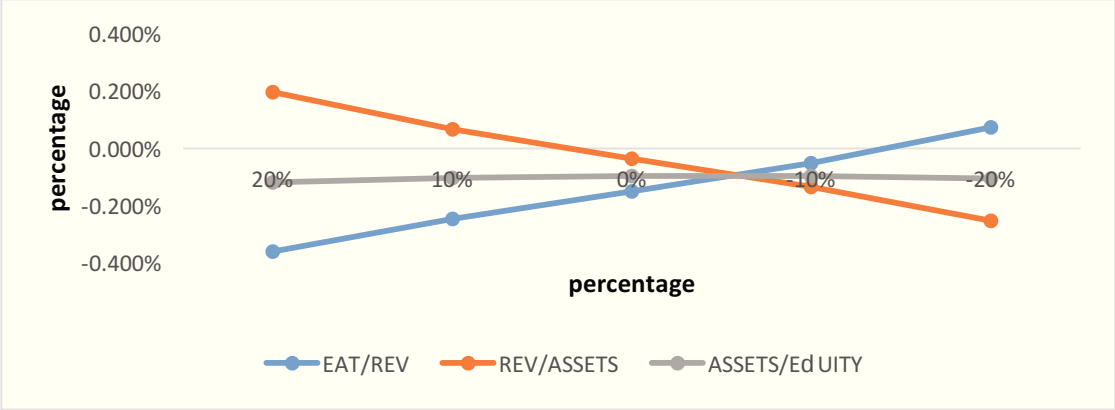


Chart 4.53 Impact of change in Equity on influence of component ratios in IM

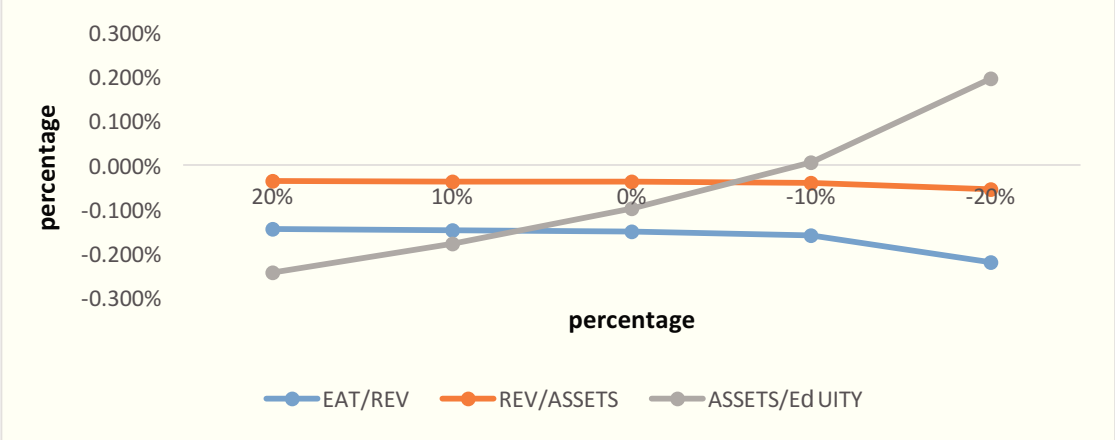
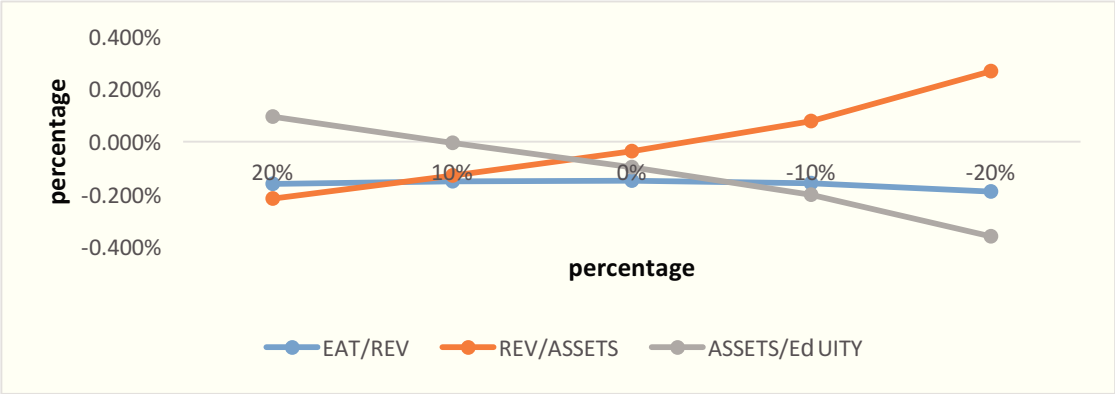


Chart 4.53 Impact of change in Assets on influence of component ratios in IM



As is showed in the chart, in the case of reducing of earning after tax, profit margin decrease, assets turnover and financial leverage increase. It is sure that profit margin is more affected by earning after tax than others. Profit margin increase, asset turnover decrease, but financial leverage increase at first than decrease when revenue decrease. Viewing equity change, when it declines, profit margin and asset turnover decrease a little bit. At the same time, financial leverage increases a lot, which means financial leverage is more sensitive to the equity. Finally, the decrease of asset influences a little decline of profit margin. For asset turnover, the affection is increase, which is the opposite from financial leverage. Although, it is not hard to see asset has more affect in asset turnover.

5. Results summary

In chapter 4, we run a specific analysis of Petro China Co, in order to better understand the financial condition of the company. First, Common-size analysis of balance sheet analyzes the changes of balance sheet, income statement, cash flow statement over 2010-2014.Then we have four methods of pyramidal decomposition of return on equity following with sensitivity analysis. According to those analysis of Petro China Co, there are some conclusions of summary and recommends for the company.

In chapter 4, the analysis finds out how well the company's financial condition and performance. The analysis shows the aspects that company should pay attention to, according to the following result:

The profitability ratios of the company are good during 2010-2014, which indicates that company performance good and has a good efficiency during these five years. The ratio shows that Petro China Co is more than able to convert its sales into profit rather than other items. The liquidity ratios have the down trend during 2012-2013, it remains stable in other years. Liquidity ratios measures company's ability to meets its immediate or short term liabilities and obligations. So the Petro China Co is able to meets its liabilities and obligations during 2010-2014, but only little weakness during 2012-2013 than other years. The solvency ratios are similar to the liquidity ratio, however, the company's financial health is good. The pyramidal decomposition points out the profit margin influence the return on equity most. In future, the company should focus on how to manage more revenues into earning which leads the increase of profit margin.

In general, the company's situation is better and better, but still has much to do to improve. Because of the unstable state of the company's financial condition. Before go further, the company should make a more stable foundation. There is a good prospect in the future.

6. Conclusion

According to the financial analysis of Petro China Co, we have a basic understanding of the financial situation in the company. Petro China Co is one of the largest companies in China and also the largest distributor and producer in gas and oil industry of China.

This thesis has 6 parts, introduction, description of the financial analysis methods, comparison of the history and present financial situation, financial analysis of Petro China Co, result summary and conclusion. We use the financial methods to analyze the company's financial condition during 2010 to 2014.

In chapter 2, we introduce the statement of financial analysis methodology that are used in the chapter 4 to help us analyze the financial situation of the company.

In chapter 3, we introduce the main businesses of the company such as exploration and production, oil and gas exploration, etc. And we also know the progress the company made on these businesses. The part of situation from different year shows the profit of each year, we know the the company's condition is stable.

In chapter 4, we analyze the company. At the beginning, we use common-size analysis for balance sheet, income statement and cash flow statement. It tells us assets increase year by year during 2010 to 2014, equity and liabilities have the same trend, but assets are always higher than liabilities plus equity. In the other hand, the earnings after tax is positive number, we can presume the financial situation of company is good. Then we have financial ratio analysis, profitability ratios are good, operating profit margin and net profit margin are high. In liquidity ratios, the current ratio is around 70% and cash ratio always less than 1 which shows the company's liquidity is not that good. According to the solvency ratios increasing year by year, the company's financial are stronger. The asset management ratios indicate the company use its assets well. After that, we have pyramidal decomposition, we have four methods to analyze ROE. The pyramidal decomposition points out the profit margin influence the return on equity most.

After the description of financial analysis of Petro China Co, it is clearly how well the company performs during 2010 to 2014. As the result, the company should focus on strengthen its ability to meet short-term liabilities and the future of the company can be bright.

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List of Abbreviations

a is component ratio

EBIT is earning before interest and tax.

EAT is earning after tax.

FM is functional decomposition method.

IM is integral method.

i_n is value of the item in comparison year

i_{n-1} is value of the item in base year.

i_n is amount of individual item

εi_n is amount of base items.

LM is logarithmic decomposition method.

MGCH is methods of gradual changes.

x is basic ratio

Δx is absolute change in the basic ratio

Δa is absolute change in component ratio

Δx_{ai} is absolute change in the basic ratio caused

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Mengyan Jin

List of annexes

Annex 1: Balance sheet statement during period of 2010 – 2014

	2010.12.31	2011.12.31	2012.12.31	2013.12.31	2014.12.31
current asset					
cash only	6159000000	7934000000	6214000000	7332000000	9502000000
Total Account receivable	6700000000	9265000000	11022000000	12320000000	10378000000
Account Receivables, gross	6470000000	8639000000	9649000000	10429000000	8614000000
Other Receivables	689000000	1058000000	1762000000	2280000000	2137000000
Inventories	15912000000	22489000000	26637000000	29076000000	20747000000
Finished goods	9715000000	12901000000	15051000000	14761000000	11894000000
Work in Progress	1610000000	2088000000	2025000000	2245000000	1646000000
Raw Material	4668000000	7601000000	9635000000	12151000000	7488000000
Progress Payment Other	815150000	101000000	748920000	808180000	281000000
Other current assets	5425000000	7871000000	8133000000	6468000000	8285000000
Miscellaneous current assets	950000000	3021000000	4051000000	5005000000	5416000000
Total current assets	34196000000	47560000000	52007000000	55196000000	48913000000
Total fixed asset	1915804000000	2322440000000	2647993000000	2944804000000	2961087000000
Property, Plant & Equipment	1460000000000	1690000000000	1950000000000	2110000000000	2180000000000
Buildings	15263000000	18099000000	20432000000	22760000000	24003000000
Other Property, Plant & Equipment	1220000000000	1440000000000	1670000000000	1940000000000	2130000000000
Accumulated Depreciation	83798000000	106000000000	1240000000000	1430000000000	1130000000000
Total Investments and Advances	7725000000	8892000000	100123000000	15099000000	14838000000
Other Long-Term Investments	228000000	221000000	218000000	205000000	267000000
Intangible Assets	4753000000	6772000000	7963000000	8942000000	9340000000
Net Goodwill	362000000	899000000	943000000	925000000	904000000
Net Other Intangibles	4391000000	5872000000	7020000000	8017000000	8436000000
Other Assets	2610000000	4072000000	4276000000	8146000000	7295000000
Tangible Other Assets	576000000	1383000000	1246000000	4761000000	3704000000
Total Assets	1950000000000	2370000000000	2700000000000	3000000000000	3010000000000
Liabilities & Shareholders' Equity					
Total Current Liabilities	50695000000	69107000000	71502000000	82673000000	72477000000
Short Term Debt	11822000000	12622000000	18123000000	14310000000	15137000000
Current Portion of Long Term Debt	601000000	4673000000	975000000	10486000000	6724000000
Accounts Payable	24657000000	28704000000	34638000000	38177000000	30031000000
income Tax Payable	4360000000	8613000000	4140000000	4515000000	865000000
Other Current Liabilities	9255000000	14494000000	13626000000	15186000000	19720000000
Accrued Payroll	672000000	739000000	518000000	619000000	627000000
Miscellaneous Current Liabilities	8583000000	13755000000	13108000000	14566000000	19093000000
Long-Term Debt	15495000000	22295000000	36547000000	36547000000	38790000000
Provision for Risks & Charges	7121000000	8478000000	10441000000	10441000000	12107000000

Deferred Taxes	2494000000	2488000000	2583000000	2583000000	495000000
Deferred Taxes - Credit	2527000000	2551000000	2763000000	2763000000	1932000000
Deferred Taxes - Debit	335030000	623150000	180000000	180000000	1438000000
Other Liabilities	400000000	602000000	1669000000	1669000000	1809000000
Total Liabilities	76238000000	1030000000000	1230000000000	1370000000000	1360000000000
Common Equity (Total)	111000000000	1240000000000	1320000000000	1320000000000	1450000000000
Common Stock Par/Carry Value	21590000000	22584000000	22769000000	22769000000	23441000000
Retained Earnings	58293000000	68065000000	74480000000	74480000000	85062000000
Cumulative Translation realized for. Exch. Gain	129000000	617000000	636000000	636000000	1787000000
Unrealized Gain/Loss Marketable Securities	0	3270000	0	0	22158000000
Revaluation Reserves	31733000000	0	0	0	0
Accumulated Minority Interest	8382000000	9832000000	14508000000	14508000000	17554000000
Total Equity	1190000000000	1340000000000	1470000000000	1470000000000	1630000000000
Liabilities & Shareholders' Equity	1950000000000	2370000000000	2700000000000	2700000000000	3000000000000

Annex 2: Income statement during period of 2010 – 2014

	2010	2011	2012	2013	2014
Sales/Revenue	45254000000	56173000000	54692000000	55649000000	53797000000
Gross Income	1580000000000	2290000000000	2570000000000	2720000000000	2740000000000
Other SG&A	10764000000	13126000000	13979000000	14364000000	13954000000
Cost of good	9992000000	1570000000000	1840000000000	1960000000000	1980000000000
Depreciation & Amortization Expense	12508000000	15614000000	18506000000	20127000000	21896000000
Depreciation	11983000000	14935000000	17718000000	19194000000	20809000000
Amortization of Intangibles	235000000	318000000	375000000	441000000	523000000
SG&A Expense	12123000000	13427000000	14606000000	16150000000	15601000000
Research & Development	1359000000	301000000	627000000	1786000000	1647000000
Other Operating Expense	10582000000	19850000000	18582000000	18465000000	16782000000
Unusual Expense	503000000	1014000000	178000000	489000000	465000000
EBIT after Unusual Expense	503000000	1014000000	178000000	489000000	465000000
Non-Operating Income/Expense	361000000	613000000	1302000000	4699000000	1569000000
Non-Operating Interest Income	228000000	506000000	254000000	280000000	248000000
Interest Expense	726000000	1311000000	2233000000	3050000000	3041000000
Gross Interest Expense	1172000000	1311000000	2712000000	3539000000	3462000000
Interest Capitalized	447000000	0	478000000	489000000	421000000
Pretax Income	21004000000	20879000000	19491000000	21170000000	18350000000
Income Tax	4422000000	4609000000	4449000000	4515000000	4749000000
Income Tax - Current Domestic	4433000000	4768000000	4415000000	6575000000	5161000000
Income Tax - Deferred Domestic	112490000	159000000	339310000	2060000000	412000000
Equity in Affiliates	714000000	1313000000	1016000000	1290000000	1380000000
Consolidated Net Income	17296000000	17583000000	16058000000	17945000000	14981000000
Minority Interest Expense	1240000000	1568000000	1880000000	1596000000	1493000000
Net Income	16056000000	16015000000	14177000000	16349000000	13488000000
Net Income After Extra ordinaries	16056000000	16015000000	14177000000	16349000000	13488000000
Net Income Available to Common	16056000000	16015000000	14177000000	16349000000	13488000000
EBITDA	35058000000	38509000000	40010000000	141161000000	43310000000

Annex3: Cash flow statement during period of 2010 – 2014

	2010.12.31	2011.12.31	2012.12.31	2013.12.31	2014.12.31
Operating Activities					
Net Income before Extraordinariness	17296000000	17583000000	16058000000	17945000000	14981000000
Depreciation, Depletion & Amortization	12508000000	15614000000	18506000000	20127000000	21896000000
Deferred Taxes	112490000	159000000	339310000	2060000000	412000000
Other Funds	2785000000	2206000000	2244000000	310380000	6128000000
Funds from Operations	32578000000	32544000000	36842000000	36044000000	42593000000
Changes in Working Capita	5051000000	475000000	8693000000	862000000	3919000000
Receivables	1221000000	4356000000	1761000000	1719000000	334000000
Accounts Payable	8568000000	8692000000	2926000000	2609000000	3867000000
Net Operating Cash Flow	37628000000	34738000000	28149000000	35182000000	46512000000
Investing Activities					
Purchase of Investments	4495000000	1223000000	3234000000	1023000000	135000000
Capital Expenditures	31257000000	34738000000	40675000000	39141000000	39311000000
Sale of Fixed Assets & Businesses	974570000	101000000	746230000	4899000000	925000000
Other Sources	263000000	492000000	1892000000	163000000	0
Net Investing Cash Flow	35391000000	35369000000	41943000000	35103000000	38251000000
Financing Activities					
Cash Dividends Paid - Total	3375000000	7623000000	7135000000	6746000000	7485000000
Other Uses	7559000000	613000000	952000000	800000000	3901000000
Reduction in Long-Term Debt	31169000000	46344000000	55190000000	69008000000	8826000000
Other Funds	6937000000	262000000	3201000000	1052000000	3650000000
Other Sources	622000000	315000000	4153000000	1852000000	250000000
Net Financing Cash Flow	6996000000	2500000000	11633000000	1154000000	5577000000
Exchange Rate Effect	268610000	376930000	239730000	223000000	131000000
Net Change in Cash	4731000000	1862000000	2185000000	1011000000	2815000000
Free Cash Flow	6372000000	31190000	12526000000	3559000000	